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CRPL-F 246 PART B

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PART B

SOLAR - GEOPHYSICAL DATA

ISSUED

FEBRUARY 1965

U. S. DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS
CENTRAL RADIO PROPAGATION LABORATORY
BOULDER, COLORADO

CRPL-F 246
PART B

NATIONAL BUREAU OF STANDARDS
CENTRAL RADIO PROPAGATION LABORATORY
BOULDER, COLORADO

Issued
28 Feb.1965

SOLAR - GEOPHYSICAL DATA

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The descriptive text was republished in November 1964, with addenda given in December 1964 and January 1965.

Beginning with this issue (CRPL-F 246 Part B), the solar flare data are being presented differently. The flares alone will be given in the table for the immediately preceding month, and the no-flare patrol observations for that month will be given only in graphical form. All of the flares available for the month four months before date of publication will be presented together with the no-flare patrol entries in tabular form. The no-flare patrol observations for that month's data will also be given graphically.

There are two additional flare observatories now reporting. They are:

Code No.	I.A.U. Abbrev.	Name, Place And Country	Former CRPL Designation
880	SHEM	SHEMAKHA, AZERBAIJAN, SSR	None
382	KAND	KANDILLI OBS., ISTANBOUL, TURKEY	None

At the end of this issue in Table IXa you will find a daily Radar Meteor Index which has been prepared by Dr. Peter Millman at the request of some ionospheric physics research workers.

DAILY SOLAR INDICES

Dec. 1964	American Relative Sunspot Numbers R_A'
1	1
2	0
3	1
4	0
5	2
6	0
7	0
8	2
9	0
10	11
11	14
12	11
13	14
14	11
15	5
16	8
17	20
18	27
19	26
20	28
21	29
22	22
23	18
24	14
25	14
26	11
27	17
28	38
29	34
30	17
31	21
Mean:	13.4

Jan. 1965	Zürich Provisional Relative Sunspot Numbers R_Z	Daily Values Solar Flux at 2800 Mc, Ottawa, Canada Flux S	S_A
1	23	85.6	82.7
2	26	84.2	81.5
3	34	82.1	79.4
4	34	80.7	78.0
5	32	80.0	77.4
6	19	80.4	77.7
7	18	78.2	75.7
8	17	77.5	74.9
9	14	76.7	74.1
10	8	76.0	73.5
11	7	75.1	72.7
12	0	75.1	72.6
13	0	75.0	72.5
14	7	74.5	72.0
15	8	74.9	72.4
16	7	73.7	71.4
17	7	73.6	71.2
18	20	74.5	72.1
19	22	73.9	71.5
20	28	76.1	73.7
21	23	76.6	74.1
22	22	76.8	74.4
23	17	75.7	73.4
24	22	76.4	74.1
25	21	75.5	73.1
26	21	75.9	73.5
27	34	79.2	76.8
28	19	77.4	75.1
29	29	79.0	76.6
30	20	81.0	78.6
31	15	80.0	77.7
Mean:	18.5	77.5	75.0

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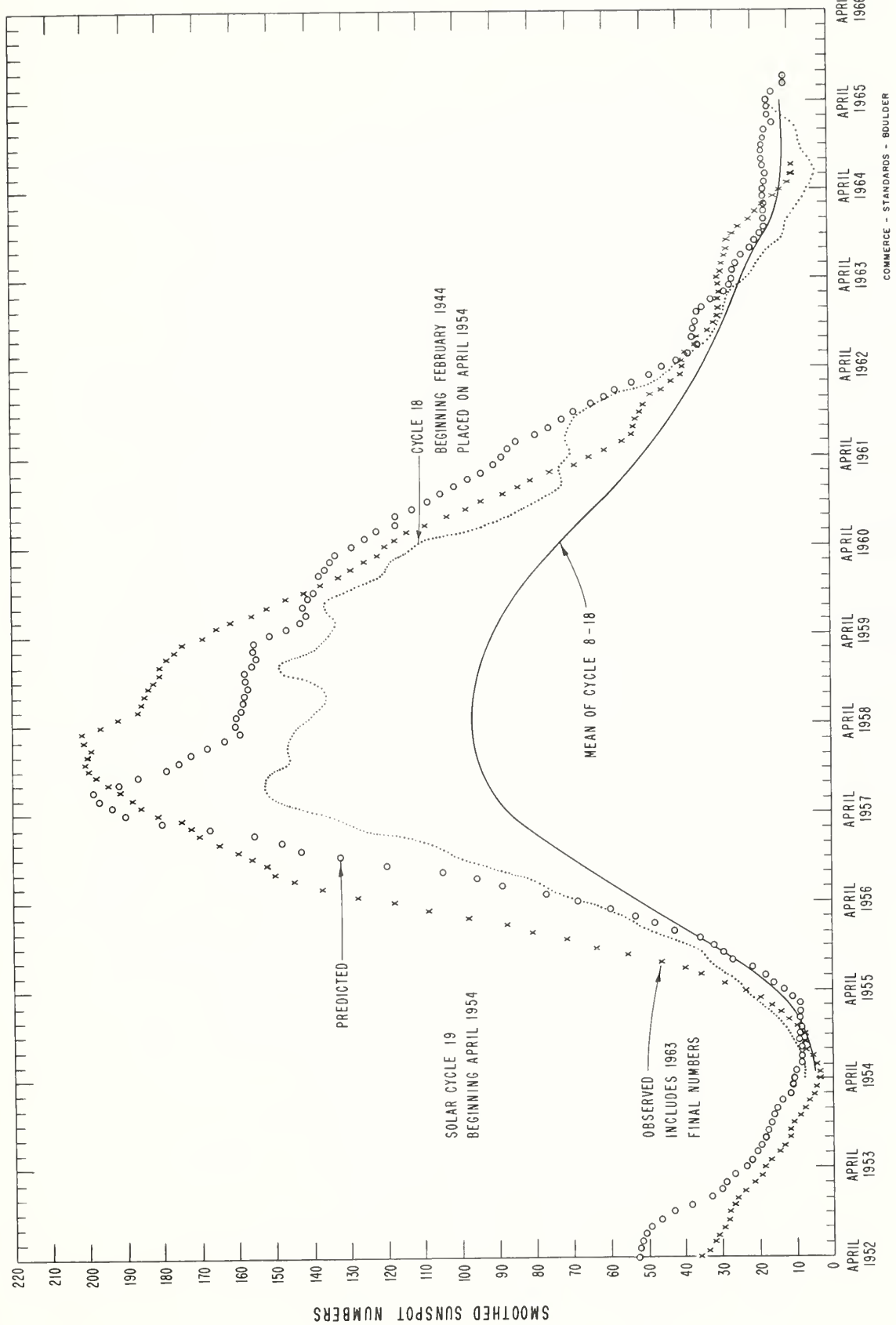
Footnote: At ARO (Ottawa) the flux is measured at 1400-1415, 1700-1715 and 2000-2015 UT. The flux given in Table Ia is that at 1700-1715 UT. When significant changes in solar flux occur, the morning and afternoon values will also be given as below:

1965	1400 UT	1700 UT	2000 UT
January 27	77.1	79.2	78.5
January 28	78.2	77.4	79.1

ERRATA: In CRPL-F 245 Part B, page Id. The daily values Adjusted to 1 Astronomical Unit for December 14 to December 22 should read:

Dec. 14 - 75.3	Dec. 17 - 77.0	Dec. 20 - 76.9
15 - 75.8	18 - 77.3	21 - 75.5
16 - 77.3	19 - 78.4	22 - 74.9

The monthly mean for December 1964 becomes 75.0.



PREDICTED AND OBSERVED SUNSPOT NUMBERS

CALCIUM PLAGE AND SUNSPOT REGIONS

JANUARY 1965

JAN. 1965	LAT.	MCMATH PLAGE NUMBER	RETURN OF REGION	CALCIUM PLAGE DATA						SUNSPOT DATA		
				CMP VALUES		HISTORY	AGE (ROTATIONS)	DATE FIRST SEEN (1)	DURATION (DAYS) (1)	CMP VALUES		HISTORY
				AREA	INT.					AREA	COUNT	
4.0	N05	7628b	New	200	2.5	b - d	1	≤1/3	~1			
4.4	N32	7632	New	(300)	(1)	b - d	1	≤1/6	~1			
4.6	S25	7633	New	(200)	(1.5)	b - d	1	≤1/6	~1			
7.1	S01	7634	New	(300)	(2)	b - d	1	≤1/9	~1			
7.3	N26	7631	7606	300	1	b - d	3	<1/4	>3			
7.6	N35	7629b	7606	400	1.5	b - d	3	<1/3	>8			
9.2	N22	7630 (2)	New	1900	3.5	ℓ - ℓ	1	1/3	>12	(121)	(2)	ℓ ⌝ d
9.4	N08	7639 (3)	New	(100)	(1)	b - d	1	1/12	1			
12.2	N09	7640 (3)	New	200	1.5	b - d	1	1/12	1			
12.4	S09	7635	7613	1200	1	b ⌜ d	2	< 1/9	>6			
12.5	N33	7641 (3)	New	100	1.5	b - d	1	1/12	1			
14.4	N21	7636	New	(100)	(-)	ℓ - d	1	≤1/9	≥3			
14.4	N04	7642	New	500	1.5	b - d	1	1/13	2			
14.6	S09	7637	7617	400	1	ℓ - d	5	≤1/9	≥6			
15.2	N25	7638 (3)	7618	300	1.5	ℓ - d	2	1/9	10			
16.7	N22	7643	New	400	2.5	b / ℓ	1	1/13	9	278	6	b - ℓ
17.4	S11	7644	New	200	1	b - d	1	1/16	1			
18.2	N07	7648	New	200	1.5	b - d	1	1/18	1			
18.4	N06	7645	New	300	2	b - d	1	1/16	~3			
18.7	S20	7653	New	(100)	(1.5)	b - d	1	1/21	~1			
18.9	N06	7649	New	300	1	b - d	1	1/18	1			
22.1	S02	7647	New	(200)	(1.5)	ℓ - d	1	1/16	1			
22.2	N34	7646	7622	1600	3	ℓ ⌜ ℓ	2	1/16	>11	36	1	b - d
23.9	N29	7650	New	(600)	(2)	ℓ - ℓ	1	1/18	11			
24.4	S24	7654	New	(200)	(1)	b - d	1	1/21	~1			
26.1	S13	7652	New	(200)	(2)	ℓ - d	1	1/20	1			
26.3	S23	7657 (3)	New	100	1	b - d	1	1/27	1			
27.3	S01	7662	New	(100)	(1.5)	b - d	1	1/29	2			
28.1	N24	7655	7626	2800	3.5	ℓ - ℓ	2	1/21	14	145	5	ℓ - d
29.7	N04	7656	New	200	1.5	b - d	1	<1/26	>3			
30.0	N05	7663 (3)	New	200	1.5	b - d	1	1/30	1			

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(1) No calcium plage observations were secured at the McMath-Hulbert Observatory on January 1, 2, 5, 6, 7, 8, 15, 17, 19, 22, 23, 24, 25, 1965.

(2) Region 7630 is a new plage, in the same position as plage 7611 of the previous rotation.

(3) These very small and ephemeral plages last for only one day.

MT. WILSON MAGNETIC CLASSIFICATIONS OF SUNSPOTS

JANUARY 1965

Jan. 1965	TIME MEAS. UT	LAT	MER DIST	TYPE
1 - 2	No Obs			
3	1810	N22	W48	βp
		N22	E71	βp
4	1815	N22	W60	βp
		N21	E59	βp
5 - 7	No Obs			
8	1925	N08	E04	αf
		N21	E06	βp
9	2400	N21	W06	αf
10	1725	N23	W19	βf
11 - 13	No Obs			
14	1850	N22	E26	αp
15	No Obs			
16	1840	N20	W04	αp
17 - 19	No Obs			
20	1910	N20	W59	βp
		N31	E13	βp
21 - 22	No Obs			
23	1650	N23	E60	βp
24 - 27	No Obs			
28	2245	N23	W01	βp
29	1845	N22	W21	βp
		N12	E59	βp
30	2255	N24	W38	αp
		N08	E54	βp *
31	1750	N08	E43	βp *

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* Only Old Cycle Observed Here This Month.

PROVISIONAL CORONAL LINE EMISSION INDICES

JANUARY 1965

The Coronal Indices will be published at a later date because the microdensitometer is undergoing repairs.

SOLAR FLARES

JANUARY 1965

OBSERVATORY	DATE JAN 1965	OBSERVED UNIVERSAL TIME START	END	MAX PHASE	LOCATION APPROX. LAT.	MER. DIST.	McMATH PLAGE REGION	DURATION — MINUTES	IMPORTANCE	OBS. COND.	MEASUREMENTS TIME — U T	MEAS AREA Sq. Deg.	CORR. AREA Sq. Deg.	MAX. WIDTH Hα	MAX. INT. %	REMARKS
BUCA	01	1013 E	1035 D	1017	N22	W15	7626		1-	2			1.80			
LOCK	01	1827	1848	1834	N22	E90	7630	21	1	C	1834	.70	3.50		10	L
LOCK	01	1920	2020	1950	N21	W22	7626		1-	C	1950	.60	.60		10	HJ
LOCK	01	2210	2232	2215	N22	E90	7630	22	1	C	2215	.50	2.50		10	L
MITK	02	0057	0116	0105	N20	W27	7626	19	1	V	0057	1.97	2.38	1.54	146	
MITK	02	0121	0128	0120	N19	W24	7626	7	1	V	0120	2.95	3.48	1.02	93	
MITK	02	0204	0212	0206	N20	W90			1-	C						
MITK	02	0353 E	0406		N21	E90	7630	13 D	1	V	0356	1.78		4.62		H
MITK	02	0415	0421	0417	N21	E90	7630	6	1	V	0414	3.93		3.25		H
ISTA	02	0810	0825		N23	W26	7626	15								
CATA	02	1030 E	1110	1039	N21	W30	7626		1-	C	1039	.86	1.11		133	E
CATA	02	1040	1138 D	1047	N20	E90	7630		1-	C	1047	.30	1.71		118	D
HTPR	02	1310	1320	1315	N24	W27	7626		1-		1315	.70	.90			
LOCK	02	1735	1750	1742	N21	W32	7626		1-	C	1742	.50	.60		10	J
SACP	02	1741 E	1822 D	1744	N21	W34	7626		1-	C		1.11	1.25		18	
LOCK	02	2000 U	2100	2015	N24	E80	7630		1-	C	2015	.40	1.20		10	L
SACP	02	2029	2046	2034	N21	E80	7630		1-	C		.45	1.35		17	
LOCK	02	2225	2330	2255	N24	E80	7630		1-	C	2255	.60	1.80		10	L
SACP	02	2243	2300	2247	N21	E78	7630		1-	C		.12	.34		18	
CAPS	03	1125 E	1133		N19	W44	7626		1-	2	1132	.60	1.20			CD
CAPS	03	1142 E	1233		N19	W44	7626		1-	2	1200	.60	1.20			D
HTPR	03	1201	1232	1215	N20	W48	7626		1-		1215	.60	1.00			E
OTTA	03	1427	1457	1443	N23	E68	7630	30	1	C	1443	1.07	2.13			E
SACP	03	1427	1512 U	1440	N24	E72	7630	45 U	1	C		2.01	4.45		19	
MCMA	03	1428	1520	1435	N22	E70	7630	52	1+	2 C	1435	1.50	4.50			FLS
MCMA	04	1615	1620 D	1617	N26	E62	7630		1-	1 P	1617	.20	.60			LS
SACP	04	1810	1836	1822	N23	E62	7630		1-	C		.33	.56		18	
MCMA	04	1819	1828 D	1823	N26	E60	7630		1-	1 C	1823	.20	.60			D
SACP	04	1908	1922	1911	N23	E62	7630		1-	C		.74	1.27		18	
SACP	04	2242	2258 D	2244	N23	E59	7630		1-	C		.24	.39		17	
SACP	04	2343	2359 D	2349	N21	E51	7630		1-	C		.76	1.05		20	
ARCE	05	0920 E	□		N23	E46	7630		1-	2	0920	.43	.67			O
SACP	05	1546	1556	1550	N22	W76	7626		1-	C		.37	.94		16	
KAND	06	0713	0717		N21	E39	7630		1-	B						
KAND	06	0810	0840		N23	W90	7626	30	2	G						
ARCE	06	0820 E	0830 D		N16	W90	7626	10 D	1	2	0820	.43	2.44			O
ARCE	06	0845 E	0900 D		N16	W90	7626	15 D	1	2	0850	.56	3.18			O
KAND	06	0847	0937	0852	N23	W90	7626	50	1+	D						
LOCK	06	1910	1926	1912	N21	E29	7630		1-	C	1912	.50	.60		20	
LOCK	06	2045	2100	2047	N21	E29	7630		1-	C	2047	.70	.80		20	
ARCE	07	0850 E	0905 D		N29	E13	7630		1-	2	0900	.69	.96			O
ARCE	07	0930 E	1000 D		N29	E13	7630		1-	2	0945	.65	.90			O
MITK	11	0110 E	0117 D		N23	W26	7629		1-	C						G
SACP	13	2035	2050	2042	N17	W84			1-	C		.41	1.47		18	

SOLAR FLARES

JANUARY 1965

OBSERVATORY	DATE JAN 1965	OBSERVED UNIVERSAL TIME START	END	MAX PHASE	LOCATION APPROX LAT.	MER DIST	McMATH PLAGE REGION	DURATION — MINUTES	IMPORTANCE	OBS COND.	MEASUREMENTS TIME U T	MEAS AREA Sq Deg.	CORR AREA Sq Deg	MAX WIDTH He	MAX INT %	REMARKS
SACP	14	1502	1524	1508	N23	E09	7638		1-	C		1.15	1.19		19	
SACP	14	2050	2126	2108	N31	W75	7630		1-	C		.49	1.30		17	
SACP	15	2151	2203	2155	N21	W08	7638		1-	C		.49	.50		17	
LOCK	16	1915	1923	1919	N35	E58	7646		1-	C	1919	.20	.40		10	
SACP	17	1452	1459	1454	N37	E67	7650		1-	C		.8	.18		17	
LOCK	17	1830	1853	1842	N32	E54	7646		1-	C	1842	.20	.30		10	
LOCK	17	2148	2216	2200	N20	W35	7643		1-	C	2200	.30	.30		10	
KAND	18	0742	0825	0755	N20	W26	7643	43	1	B						
ISTA	18	0743 E	0810		N23	W20	7643	27 D	1-							
CATA	18	0840 E	0905	0849	N22	W27	7643		1-	C	0849	.40	.48		151	D
KAND	18	0845	0855	0850	N22	W25	7643	10	1	D						
HTPR	18	0846	0852	0848	N22	W19	7643		1-		0848	.40	.50			
KAND	18	0925	0930		N22	W27	7643		1-	D						
HALE	18	2236 E	2253 D	2239	N19	E55			1-	4	2239	.10	.15			C
HALE	19	2057 E	2208 D	2100	N20	W44	7643		1-	4	2100	.50	.70			C
HALE	20	0155 E	0240 D	0158	N20	W46	7643		1-	4	0158	.40	.50			C
ARCE	20	0815 E	0835 D		N22	W55	7643		1-	3	0815	.88	1.59			O
ARCE	20	0855 E	0925 D		N22	W55	7643		1-	3	0905	.85	1.54			O
CAPS	20	0910 E	0940 D		N23	W47	7643	30 D	1	2	0915	2.20	3.50		160	J
ARCE	20	0945 E	1000 D		N22	W55	7643	15 D	1	3	0955	1.41	2.55			O
CATA	20	1130	1140	1137	N22	W49	7643		1-	C	1137	.66	1.20		138	E
CAPS	20	1300	1315		N29	E24	7646		1-	2	1305	.80	1.00		152	D
LOCK	20	1900	1930	1914	N21	W56	7643		1-	C	1914	.20	.30		10	
LOCK	20	2023	2034	2026	N20	W59	7643		1-	C	2026	.40	.50		10	
LOCK	20	2236	2310	2242	N20	W61	7643		1-	C	2242	.30	.50		10	
HALE	20	2324 E	2348 D	2330	N25	E90	7655		1-	4	2339	.50				CK
HALE				2339												CK
MITK	21	0005	0012	0008	N33	E15	7646		1-	C						
MITK	21	0028	0037	0032	N26	W70	7643		1-	C						
KAND	21	1306 E	1419 D	1359	N26	E90	7655	73 D	1+	B						
MCMA	21	1410	1418	1414	N26	E90	7655		1-	2 C	1414	.80				
MCMA	21	2000 E	2018 D		N19	W85	7643		1-	1 P	2000	.40				D
MITK	22	0318	0352	0332	N21	W85	7643		1-	C						
MITK	22	0520	0536	0524	N21	W90	7643		1-	C						
KAND	22	0659 E	0755 D	0729	N22	W90	7643	56 D	1	B						
KANZ	22	0819	0903		N21	W85	7643		1-							
CATA	22	0840 E	1200 D	1033	N10	W90	7643	200 D	1+	C	1033	.62	3.52		126	D
ARCE	22	0915 E	0940 D		N19	W85	7643	25 D	1	3	0915	.49	2.00			O
KANZ	22	0930 E	0952 E		N21	W85	7643		1-							
KANZ	22	0959 E	1005 E		N21	W85	7643		1-							
ARCE	22	1000 E	1005 D		N20	W82	7643		1-	3	1003	.46	1.69			O
CATA	22	0848 E	1200 D	1033	N23	E90	7655	192 D	1	C	1033	.72	2.94		141	D
LOCK	22	1607	1632	1617	N20	E90	7655		1-	C	1617	.30	1.50		10	H
LOCK	22	1920 E	1950	1923 U	N20	E90	7655		1-	C	1923	.30	1.50		10	

SOLAR FLARES

JANUARY 1965

OBSERVATORY	DATE JAN 1965	OBSERVED UNIVERSAL TIME START	END	MAX. PHASE	LOCATION APPROX. LAT.	MER. DIST	McMATH PLAGE REGION	DURATION — MINUTES	IMPORTANCE	OBS. COND.	MEASUREMENTS TIME — U T	MEAS. AREA Sq. Deg.	CORR. AREA Sq. Deg.	MAX WIDTH Hα	MAX. INT. %	REMARKS
LOCK	22	2005	2027	2015	N20	E90	7655		1-	C	2015	.20	1.00		10	
LOCK	22	2052	2120 D	2102	N20	E90	7655		1-	C	2102	.20	1.00		10	
HTPR	23	1015	1047	1025	N25	E55	7655		1-		1025	.70				E
HTPR	24	0954	1004	0959	N24	E44	7655		1-		0959	.40	.60			D
KANZ	24	1337	1430		N23	E57	7655		1-							
HTPR	24	1409 E	1432	1412	N21	E55	7655		1-		1412	.30				D
SACP	24	1412 E	1435 U	1419 U	N23	E56	7655		1-	C		.43	.66		18	
KANZ	24	1441	1452		N23	E57	7655		1-							
SACP	24	1526	1555	1536	N21	E41	7655		1-	C		.16	.20		19	
LOCK	24	1648	1710	1655	N28	E53	7655		1-	C	1655	.30	.50		10	
SACP	24	1650	1714 U	1655	N28	E54	7655		1-	C		.40	.63		17	
SACP	24	1919	1950 U	1934	N22	E52	7655		1-	C		.53	.75		18	
SACP	24	2012	2025 U	2017	N23	E51	7655		1-	C		.49	.69		18	
LOCK	24	2020 E	2035 D	2025 U	N23	E50	7655		1-	C	2025	.30	.50		10	H
LOCK	25	2103	2120	2110	N24	E32	7655		1-	C	2110	.30	.40		10	
LOCK	25	2218	2229	2222	N22	E36	7655		1-	C	2222	.40	.50		10	
HTPR	26	1345	1354	1348	N25	E10	7655		1-		1348	.60	.80			E
LOCK	26	1729	1748	1732	N21	E11	7655		1-	C	1732	.30	.30		10	
LOCK	26	2227	2243	2235	N30	W46	7650		1-	C	2235	.20	.30		10	H
LOCK	26	2357	0016	0001	N30	W46	7650		1-	C	0001	.30	.50		10	H
MCMA	27	1656	1700 D		N23	E00	7655		1-	1 P	1656	.30	.30			E
MITK	28	0217	0232	0217	N20	E10	7655	15	1	V	0219	1.97	2.22	1.44	115	F
MITK	28	0434	0449	0435	N20	E09	7655	15	1	V	0435	1.67	1.87	1.54	107	E
SACP	28	1542	1545	1543	N22	E01	7655		1-	C		.74	.76		18	
LOCK	28	1701	1714	1706	N21	E01	7655		1-	C	1706	.10	.10		10	J
LOCK	28	1947	1956	1949	N08	E90	7661		1-	C	1949	.10	.50		10	
LOCK	28	2357	0020	0007	N07	E80	7661		1-	C	0007	.30	.70		10	
LOCK	28	2359	0015	0004	N28	W08	7655		1-	C	0004	.40	.40		20	
SACP	29	0002	0014	0004	N22	W06	7655		1-	C		.29	.30		18	
OTTA	29	1629	1641	1632	N12	E73	7661		1-	C	1632	.17	.37			H
SACP	29	1629	1645	1633	N12	E71	7661		1-	C		.24	.51		17	
LOCK	29	1629	1647	1635	N09	E71	7661		1-	C	1635	.60	1.20		10	H
MCMA	29	1630	1641	1636	N07	E76	7661		1-	2 C	1636	.50				SH
LOCK	29	1648	1710	1657	N12	E71	7661		1-	C	1657	.60	1.20		10	H
MCMA	29	1655	1703	1658	N09	E75	7661		1-	1 C	1658	.50				S
LOCK	29	1805	1828	1814	N12	E71	7661		1-	C	1814	.50	1.00		10	H
LOCK	29	2010	2055	2020	N12	E71	7661		1-	C	2020	.40	.80		10	
LOCK	29	2128	2135	2130	N08	E71	7661		1-	C	2130	.50	1.00		20	J
SACP	29	2128	2135	2131	N09	E70	7661		1-	C		.66	1.29		18	
LOCK	29	2334	2355	2343	N09	E71	7661		1-	C	2343	.10	.20		10	J
MITK	30	0142	0153	0142	N07	E66	7661	11	1	V	0142	.88	2.06	1.75	107	D
LOCK	30	1920	1945	1930	N07	E55	7661		1-	C	1930	.30	.50		10	H
MCMA	30	1922	1935	1928	N09	E58	7661		1-	1 C	1928	.80	1.60			E

COMMERCE - STANDARDS - BOULDER

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SOLAR FLARES

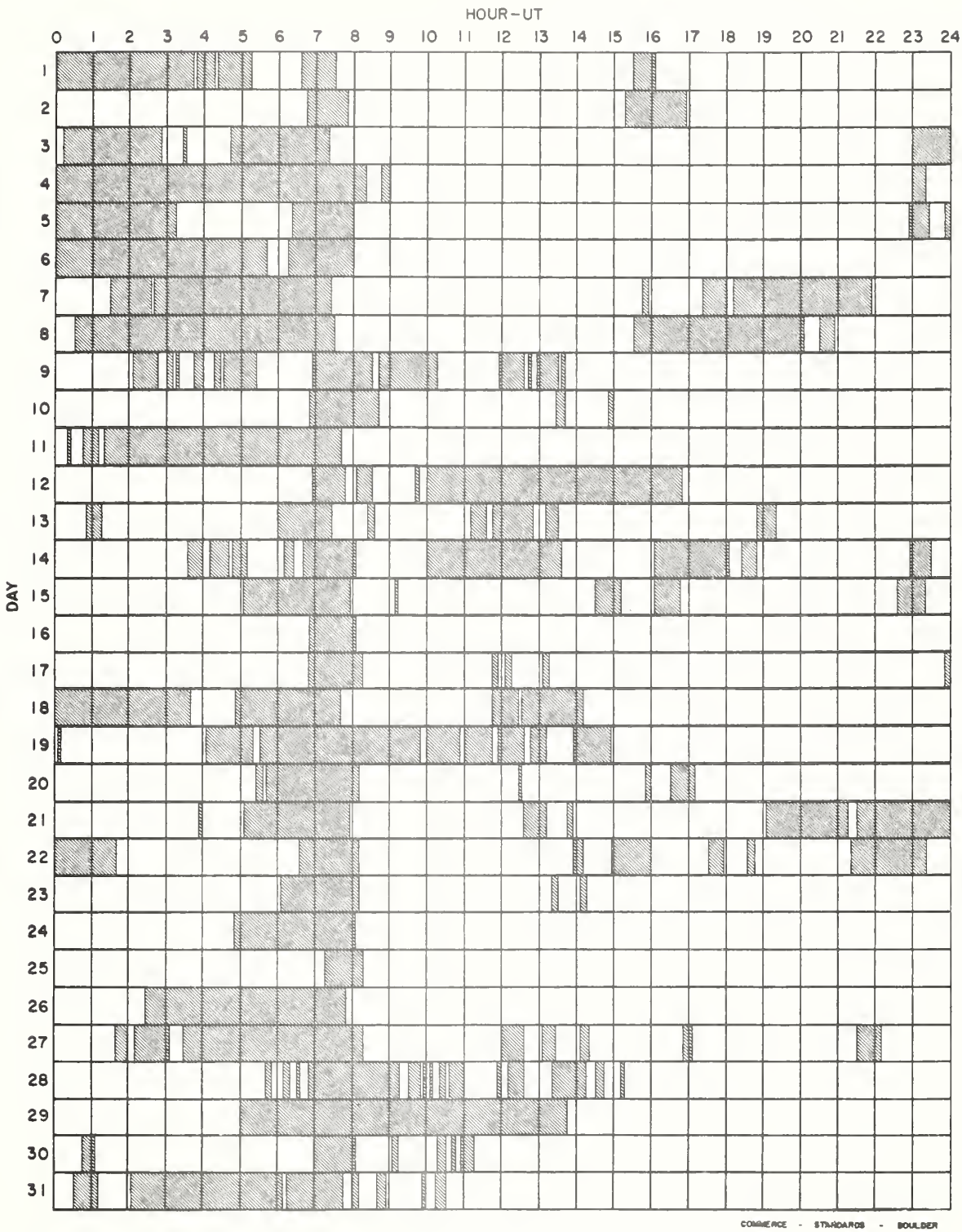
JANUARY 1965

OBSERVATORY	DATE JAN 1965	OBSERVED UNIVERSAL TIME START	END	MAX PHASE	LOCATION APPROX. LAT.	MER DIST	McMATH PLAGE REGION	DURATION — MINUTES	IMPORTANCE	OBS. COND.	MEASUREMENTS TIME — U T	MEAS. AREA Sq Deg.	CORR. AREA Sq Deg	MAX. WIDTH Hα	MAX INT. %	REMARKS
SACP	30	1925	1945	1928	N07	E56	7661		1-	C		•49	•70		18	
LOCK	30	2025	2056	2031	N07	E55	7661		1-	C	2031	•30	•50		10	H
SACP	30	2026	2048	2030	N08	E56	7661		1-	C		•66	•93		18	
LOCK	30	2225	2247	2235	N07	E55	7661		1-	C	2235	•20	•40		10	H
LOCK	31	0020	0030 D	0025	N05	E55	7661		1-	C	0025	•20	•40		10	H
KAND	31	1314 E	1323		N05	E43	7661		1-	G						
SACP	31	1530	1553	1533	N07	E46	7661		1-	C		•41	•51		17	
LOCK	31	2010	2034	2017	N07	E45	7661		1-	C	2017	•50	•60		10	J
MCMA	31	2013	2024 D	2015	N09	E43	7661		1-	1 P	2015	•50	•70			E
SACP	31	2013	2040	2015	N09	E44	7661		1-	C		1•08	1•29		19	

COMMERCE - STANDARDS - BOULDER

INTERVALS OF NO FLARE PATROL OBSERVATIONS
PROVISIONAL

JANUARY 1965



Observatories Included:

Arcetri	Catania	Herstmonceux	Lockheed	Sacramento Peak
Bucharest	Haleakala	Istanboul	Mitaka	Tortosa
Capri-S (Swedish)	Haute-Provence	Kanzelhohe	Ottawa	

SOLAR FLARES

OCTOBER 1964

OBSERVATORY	DATE OCT 1964	OBSERVED UNIVERSAL TIME START	OBSERVED UNIVERSAL TIME END	OBSERVED UNIVERSAL TIME MAX PHASE	LOCATION APPROX. LAT.	LOCATION APPROX. MER DIST	LOCATION McMATH PLAGE REGION	DURATION — MINUTES	IMPORTANCE	OBS. COND.	MEASUREMENTS TIME — U T	MEASUREMENTS MEAS. AREA Sq. Deg.	MEASUREMENTS CORR AREA Sq. Deg	MEASUREMENTS MAX WIDTH Ha	MEASUREMENTS MAX INT *.	REMARKS
CATA	01	0800 E	0830 D	0805	S07	W21			1-							
ARCE	01	0815 E	0845 D		S07	W23			1-	3	0840	.72	.81			
UCCL	01	0926	0935	0927	N44	E60	7503		1-	4						DK
UCCL	01	0945	0948	0946	S07	W24	7508		1-	4						D
UCCL	01	1016	1042 D	1018	N23	W68	7504		1-	4						EK
UCCL	01	1039	□		S07	W24	7508		1-	4						E
UCCL	01	1103	1110		S07	W24	7508		1-	3						D
UCCL	01	1130	1134		S07	W24	7508		1-	3						E
UCCL	01	1142	1215 D		S07	W24	7508		1-	3						D
UCCL	01	1340	1352		N22	W67	7504		1-	3						E
UCCL	02	0930	0950		S07	W38	7508		1-	3						D
UCCL	02	1015	1022 D		N24	W85	7504		1-	2						D
UCCL	02	1130	1200 D		S07	W38	7508		1-	2						EK
UCCL	02	1412	1455		S07	W38	7508		1-	2						D
LOCK	03	1822	1830	1825	N06	E44			1-	C	1825	.20	.20		10	
CAPE	04	0802	0841	0812	S07	W67	7508		1-	C	0812	.50	1.30			J
CAPE	04	0910	0940	0914	S07	W67	7508		1-	C	0914	.80	2.10			J
CAPR	04	0920 E	0930		S11	W62			1-	3	0926	.80	1.60			
UCCL	04	0926 E	0958 D		S05	W70	7508		1-	2						E
CAPR	04	1317 E	1327		S11	W62			1-	3	1319	.80	1.60			
CAPR	04	1420 E	1433		S11	W63			1-	3	1422	.90	1.80			
HALE	04	1758 E	1813 D	1802	S09	W69			1-	2	1802	.10	.20			
MCMA	04	1835	1855	1840	S08	W72	7508		1-	C	1840	.40				H
CLMX	04	1838	1847	1841	S05	W74	7508		1-	C	1841	.60	1.20			
HALE	04	1838 E	1848	1839	S08	W70			1-	2	1839	.50	1.00			
HUAN	04	1843 E	1852		S08	W74			1-	P	1844	.20				
LOCK	04	2012	2041	2030	N24	W58			1-	C	2030	.20	.30		10	
HALE	04	2206 E	2211	2207	S08	W70			1-	2	2207	.10	.20			
HALE	04	2351 E	0031	2358	S08	W71			1-	2	2358	.30	.60			
HALE	05	0147	0159	0152	S08	W80			1-	2	0152	.60	1.60			
UCCL	05	0907	0910		S06	W85	7508		1-	2						E
ARCE	05	0940 E	1000 D		N23	W24			1-	3	0950	.49	.55			
UCCL	05	1204	1206 D		S06	W85	7508		1-	3						D
CAPR	05	1440 E	1453		S10	W85			1-	3	1445	.30				
CAPR	05	1454	1510 D		S10	W85			1-	3	1500	.80				
HALE	05	1801 E	1805	1801	S10	W90				3	1801	.20				
HALE	05	1849	1919 D	1853	S10	W90				3	1853	.20				
HALE	05	2010	2029	2014	S10	W90				4	2014	.20				
HALE	05	2105	2128	2116	S11	W90				2	2116	.40				
HALE	06	0102	0143	0125	N24	W33			1-	3	0125	.30	.30			
HALE	06	0119	0134	0125	N23	W35			1-	3	0125	.20	.20			
HALE	06	0119	0137 D	0121	N26	W31			1-	3	0121	.60	.70			
HALE	06	0200	0214	0202	S09	W90				4	0202	.20				
HALE	06	0210	0220	0213	N23	W33			1-	3	0213	.20	.20			
HALE	06	0228	0254	0231	N24	W33			1-	4	0231	.20	.20			
CAPE	06	0625 E	0705		N25	W38	7512	40 E	1	C	0625	1.60	2.10			J

SOLAR FLARES

OCTOBER 1964

OBSERVATORY	DATE OCT 1964	OBSERVED UNIVERSAL TIME START	OBSERVED UNIVERSAL TIME END	OBSERVED UNIVERSAL TIME MAX PHASE	LOCATION APPROX LAT.	LOCATION APPROX MER DIST	LOCATION McMATH PLAGE REGION	DURATION — MINUTES	IMPORTANCE	OBS. COND.	MEASUREMENTS TIME — U T	MEAS. AREA Sq. Deg.	CORR. AREA Sq. Deg.	MAX WIDTH Ha	MAX INT. %	REMARKS
ARCE	06	0845 E	0915 D		N23	W39	7512	30 D	1	3	0900	1.51	2.00			
BUCH	06	0910 E	0921 D		N25	W37			1-	3			.70			
ARCE	06	0945 E	□		N23	W39			1-	3	0945	.85	1.13			
HALE	06	1913	1934	1923	N23	W45			1-	3	1923	.20	.20			
HALE	06	1950	2035	2020	N23	W43			1-	4	2020	.30	.40			
HALE	06	2040	2115	2059	N24	W44			1-	4	2059	.70	.80			
LOCK	06	2122	2140	2128	N26	W46			1-	C	2128	.30	.30		10	
HALE	06	2128	2134	2130	N21	W45			1-	3	2130	.20	.20			
LOCK	06	2231	2252	2239	N26	W46			1-	C	2239	.50	.50		10	
SAC	06	2233	2253	2237	N23	W47			1-	C		1.67	2.04		17	
CLMX	06	2234	2245	2237	N25	W47	7512		1-	C	2237	.60	.70			
HALE	07	0038	0048	0039	N22	W47			1-	3	0039	.30	.40			
HALE	07	0119	0211	0138	N26	W45			1-	2	0138	.80	1.00			
MANI	07	0130 E	0150		N24	W48			1-	2	0130	.25	.32			
BUCH	07	0720 E	0726 D		N25	W50			1-	2			.90			
BUCH	07	0833 E	0842 D		N25	W51			1-	2			.50			
BUCH	07	0857 E	0905 D		N25	W51			1-	2			.90			
CAPE	07	0917	0930	0919	N26	W52	7512		1-	C	0919	1.20	1.90			J
ARCE	07	0940 E	0950 D		N22	W52			1-	3	0940	.72	1.16			
CAPR	07	1232 E	1338		N24	W51			1-	2	1312	.30	.60			
SAC	07	1317 E	1343	1330	N26	W51			1-	C		.26	.33		18	
CAPR	07	1342 E	1404		S12	W23			1-	2	1400	.30	.30			
HUAN	07	1350 E	1410		S11	W22			1-	P	1400	.20	.20			
CAPE	07	1355	1407	1357	N26	W52	7512		1-	C	1357	.80	1.30			J
CAPR	07	1411 E	1416		S12	W23			1-	2	1414	.40	.40			
SAC	07	1411	1418	1412	S12	W22			1-	C		.56	.58		19	
MCMA	07	1412	1418	1414	S12	W22	7514		1-	C	1414	.30	.30			
HUAN	07	1450	1550	1510	N26	W53			1-	P	1510	1.00	1.70			
CAPR	07	1457	1548 D		S12	W24			1-	3	1508	.40	.40			
SAC	07	1507 E	1600	1533	S12	W23			1-	C		.42	.43		21	
LOCK	07	1515 E	1555	1530	S11	W24			1-	C	1530	.20	.20		10	
MCMA	07	1523 E	1610	1526	S12	W24	7514		1-	C	1526	.20	.20			
LOCK	07	1650	1720	1657	S11	W24			1-	C	1657	.40	.40		10	
LOCK	07	1715	1755	1730	N25	W56			1-	C	1730	.30	.50		10	
LOCK	07	1843	1910	1855	N25	W56			1-	C	1855	.40	.60		10	
HALE	07	1849	1905	1857	N24	W57			1-	4	1857	.20	.30			
HALE	07	1949	2034		N19	W56			1-	4	1949	.20	.30			
LOCK	07	2004	2019	2009	N07	W80			1-	C	2009	.20	.50		10	
HALE	07	2137	2142 D		N21	W63			1-	4	2142	.20	.30			
LOCK	08	0011	0024	0016	N23	W47			1-	C	0016	.10	.10		10	
	08	0045	0215	NO FLARE	PATROL											
SIBE	08	0424	0443 D	0429	N25	W64	7512	19 D	1	C	0429	.83	2.22		50	CEHKL
CAPE	08	0649 E	0700		N25	W66	7512		1-	C	0650	.70	1.70			J
CAPE	08	0807	0828	0815	N26	W66	7512	21	1	C	0815	1.00	2.40			J
BUCH	08	0845 E	0855 D		N26	W60			1-	2			1.10			
CAPE	08	0927	0949	0930	N25	W66	7512	22	1	C	0930	.60	1.40			J
CAPE	08										0936	1.60	3.80			
BUCH	08	0928 E	0940 D		N26	W60			1-	2			1.60			
CATA	08	0930 E	0945 D	0935	N25	W65			1-							

COMMERCE - STANDARDS - BOULDER

SOLAR FLARES

OCTOBER 1964

OBSERVATORY	DATE OCT 1964	OBSERVED UNIVERSAL TIME START	END	MAX PHASE	LOCATION APPROX LAT	MER DIST	McMATH PLAGE REGION	DURATION — MINUTES	IMPORTANCE	OBS. COND.	MEASUREMENTS TIME U T	MEAS. AREA Sq. Deg	CORR AREA Sq. Deg	MAX WIDTH Ha	MAX INT	REMARKS
CAPE	08	1112	1122	1115	N25	W66	7512		1-	C	1115	.60	1.40			J
TACH	08	1113	1119	1114	N25	W67	7512		1-	C	1114	.50	1.20		80	D
CAPE	08	1231	1310	1234	N25	W67	7512	39	1+	C	1234	2.30	5.60			J
HUAN	08	1420 E	1510	1450	N25	W68			1-	P	1450	.50	1.30			
CLMX	08	1429	1458		N25	W76	7512		1-	C	1447	.40	.60			G
LOCK	08	1717	1755	1722	N26	W63			1-	C	1722	.50	.90		10	
LOCK	08			1736												
LOCK	08	1835	1905	1848	N25	W70			1-	C	1848	.60	1.10		10	
LOCK	08	1919	1940	1924	N25	W70			1-	C	1924	.60	1.10		10	
HUAN	08	1940	2010		N25	W69			1-	P	1950	.30	.80			
LOCK	08	1943	2025	1952	N25	W70			1-	C	1952	.60	1.10		10	
LOCK	08	2057	2120	2107	N25	W72			1-	C	2107	.50	1.00		10	
LOCK	08	2135	2155	2142	N25	W72			1-	C	2142	.40	.80		10	
LOCK	08	2250	2317	2304	N25	W72			1-	C	2304	.60	1.20		10	
HTE-	09	0924	0941 D		N25	W80			1-			.30				
IZMI	09	1012	1028	1020	N23	W80	7512	16	1	P	1020	1.80	4.00		50	
	09	1215	1300	NO FLARE	PATROL											
LOCK	09	1823	1843	1831	N25	W76			1-	C	1831	.30	.70		10	
LOCK	09	1917	1931	1925	N25	W82			1-	C	1925	.30	.80		10	
LOCK	09	2005	2012	2008	N25	W85			1-	C	2008	.30	.90		10	
LOCK	09	2043	2107	2050	N30	W80			1-	C	2050	.20	.50		10	
MITK	10	0116	0120	0118	N24	W90	7512		1-	C						
MITK	10	0210	0229	0215	N24	W90	7512		1-	C						
TACH	10	0322	0356	0322	N25	W87	7512	34	1	C	0322	.50	5.60		65	
MITK	10	0327	0358	0340	N24	W90	7512	31	1	C						
VORO	10	0333 E	0347		N23	W90	7512		1-	P	0339	.63	.63		72	
BUCH	10	0834 E	0910 D		N26	W87			1-	3						
LOCK	10	1845	1920	1850	N25	W90			1-	C	1850	.30	1.50		10	
LOCK	10	1852	1858	1856	N45	W72			1-	C	1856	.30	.70		10	
MITK	11	0336	0410	0405	N08	W90		34	1	C						GH
	11	1230	1305	NO FLARE	PATROL											
LOCK	11	1715	1738	1730	N09	E90			1-	C	1730	.30	1.50		10	
LOCK	11	2119	2136	2126	N11	E08			1-	C	2126	.10	.10		10	
SAC	11	2120	2136	2125	N12	E08			1-	C		.35	.35		17	
SAC	11			2132												
	12	1000	1045	NO FLARE	PATROL											
LOCK	12	2325	2355 D	2335	N00	E64			1-	C	2335	.30	.50		10	
	13	0530	0555	NO FLARE	PATROL											
	13	1155	1245	NO FLARE	PATROL											
	13	1255	1320	NO FLARE	PATROL											
MCMA	13	1405	1416		N00	W50	7520		1-	C	1410	.30	.50			
SAC	15	1847	1908	1850	N08	E36			1-	C		.70	.74		17	
MCMA	15	1848	1855	1850	N09	E35	7521		1-	C	1850	.40	.50			
	17	1150	1205	NO FLARE	PATROL											

COMMERCE - STANDARDS - BOULDER

SOLAR FLARES

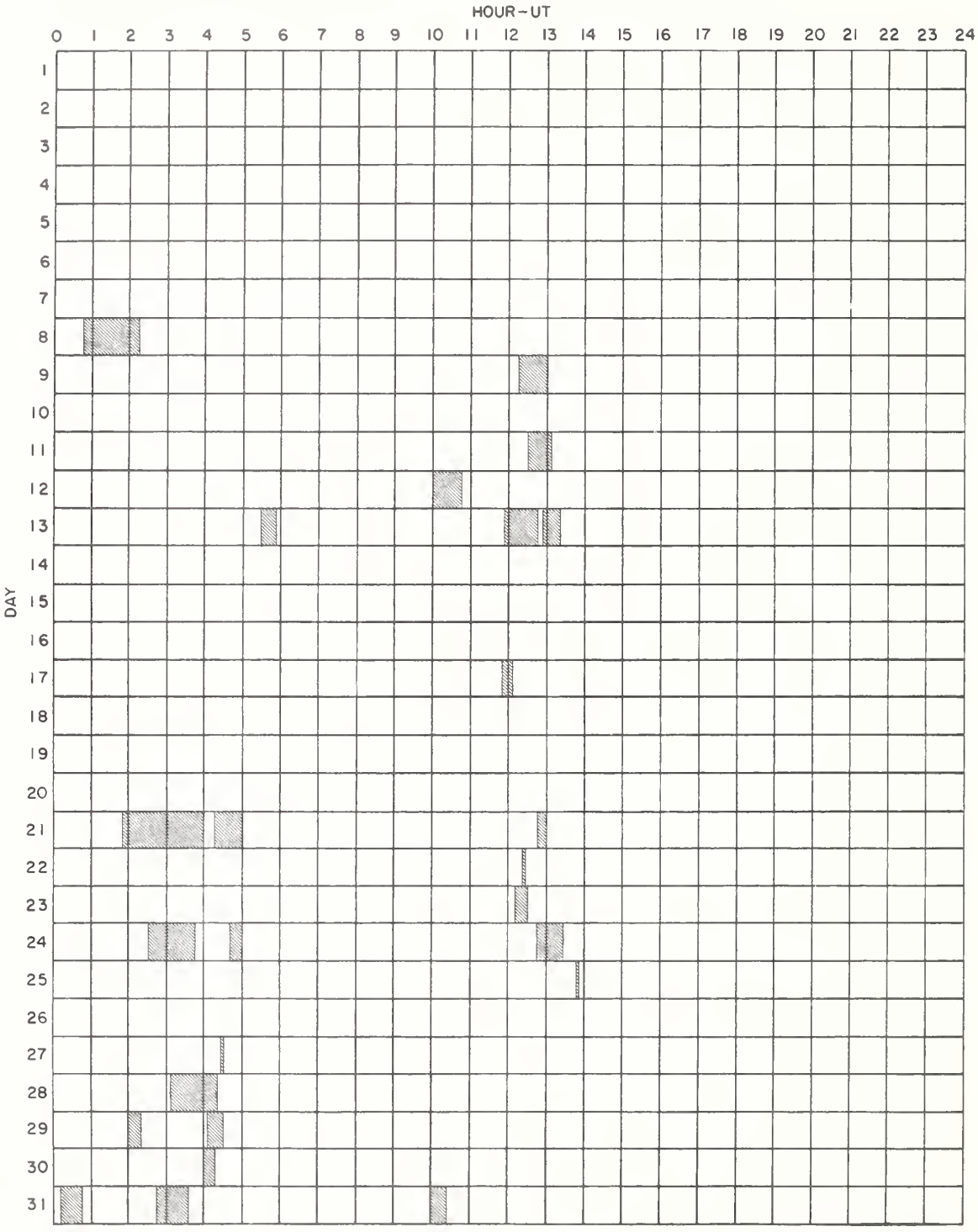
OCTOBER 1964

OBSERVATORY	DATE	OBSERVED UNIVERSAL TIME			LOCATION APPROX.		McMATH PLAGE REGION	DURATION — MINUTES	IMPORTANCE	OBS. COND.	MEASUREMENTS TIME — U T	MEAS AREA Sq. Deg.	CORR. AREA Sq. Deg	MAX. WIDTH Ha	MAX. INT. *0	REMARKS
	OCT 1964	START	END	MAX PHASE	LAT	MER DIST										
ARCE	18	1000 E	□		N30	E00			1-	3	1000	.82	.90			
UCCL	18	1145	1155		N30	W01	7531		1-	2						E
LOCK	19	1715	1745	1727	S11	E52			1-	C	1727	.30	.40		10	
LOCK	19	1800	1845	1816	S07	W60			1-	C	1816	.30	.50		10	
	21	0150	0400	NO FLARE PATROL												
	21	0415	0500	NO FLARE PATROL												
	21	1245	1300	NO FLARE PATROL												
	22	1220	1225	NO FLARE PATROL												
	23	1210	1230	NO FLARE PATROL												
	24	0230	0345	NO FLARE PATROL												
	24	0440	0500	NO FLARE PATROL												
	24	1245	1325	NO FLARE PATROL												
LOCK	24	2325	2350	2329	N06	W40			1-	C	2329	.20	.20		10	
	25	1345	1350	NO FLARE PATROL												
SAC	25	2043	2059	2051	N28	E69			1-	C		.27	.52		16	
SAC	26	1527	1550	1535	S20	E17			1-	C		.97	1.00		17	
	27	0425	0430	NO FLARE PATROL												
UCCL	27	0910	0925		S11	W06	7533		1-	2						E
	28	0305	0420	NO FLARE PATROL												
SYDN	28	0635	0649	0639	N24	E47	7538	14	1	C	0639	3.00	4.50			
	29	0200	0220	NO FLARE PATROL												
	29	0405	0430	NO FLARE PATROL												
ARCE	29	0810 E	0825 D		S14	E06			1-	4	0820	.57	.61			
SAC	29	1446	1532	1450	S13	E04			1-	C		.27	.27		17	
CAPR	29	1451	1512		S12	E05			1-	3	1456	.50	.50			
	30	0400	0420	NO FLARE PATROL												
	31	0010	0045	NO FLARE PATROL												
	31	0245	0335	NO FLARE PATROL												
ARCE	31	0840 E	0850 D		S08	E23			1-	2	0848	.82	.90			
	31	1000	1025	NO FLARE PATROL												
ONDR	31	1038	1039		S07	E26			1-	3						
LOCK	31	2330	2350	2340	S06	E10			1-	C	2340	.10	.10		10	

COMMERCE - STANDARDS - BOULDER

INTERVALS OF NO FLARE PATROL OBSERVATIONS

OCTOBER 1964



Observatories Included:

Abastumani	Capri-S (Swedish)	Herstmonceux	Kodaikanal	Mitaka	Sydney
Arcetri	Catania	Huancayo	Locarno	Ondrejov	Tachkent
Arosa	Climax	Ikomasan	Lockheed	Ottawa	Uccle
Bucharest	Crimee	Istanboul	Lvov	Sacramento Peak	Vorochilov
Capetown	Haleakala	Izmiran	Manila	Shemakha	Wroclaw
Capri-F (German)	Haute-Provence	Kiev	McMath-Hulbert	Siberie	Zurich

IONOSPHERIC EFFECTS OF SOLAR FLARES

SHORT WAVE RADIO FADEOUTS — SUDDEN PHASE ANOMALIES
SUDDEN COSMIC NOISE ABSORPTION — SUDDEN ENHANCEMENTS OF SIGNAL
SUDDEN ENHANCEMENTS OF ATMOSPHERICS — SUDDEN FREQUENCY DEVIATIONS
SOLAR NOISE BURSTS AT 18 Mc/s

DECEMBER 1964

DEC. 1964	UNIVERSAL TIME			TYPE SWF	IMPORTANCE						BUR	WIDE SPREAD INDEX	STATIONS	KNOWN FLARE
	START	END	MAX	IMP	ABS	SCNA	SEA	SPA	SES	SFO				
15	0905	0908									1	5	RO•MA	

COMMERCE - STANDARDS - BOULDER

RIOMETER EVENTS

(Provisional)

DECEMBER 1964

South Pole **26 Mc/s**

DEC. 1964	START UT	END UT	MAX. UT	MAX. ABSORP. db, (tenths)	NO. OF PEAKS	DEC. 1964	START UT	END UT	MAX. UT	MAX. ABSORP. db, (tenths)	NO. OF PEAKS
1	0126	0440	0204	13	3	15	1022	1551	1258	5	3
1	0804	1737	1010	9	4	16	0403	1842	1441	24	1
1	2340	0127	0011	6	5	17	0106	0137	0123	12	2
2	2248	2343	2321	6	1	17	0518	1412	0938	10	1
3	0437	0525	0450	4	2	18	0154	0330	0207	13	1
3	0944	2045	1254	10	5	18	2059	0134	0029	7	4
4	0353	0422	0358	7	1	19	**	2210	1347	8	1
4	1134	1915	1450	9	1	20	0619	1548	1113	10	1
5	*					21	0945	1631	1418	6	1
6	*					22	1000	2141	1604	5	1
7	1059	1446	1257	12	1	23	*				
7	2222	2308	2230	3	1	24	*				
8	0507	0941	0510	6	1	25	1426	1803	1610	4	1
9	0835	1341	1039	10	1	25	2314	0224	2321	15	1
9	2245	0023	2249	8	3	26	1511	1538	1523	3	1
11	*					27	0006	0234	0046	3	2
12	0451	0715	0536	3	1	28	0219	0307	0234	9	1
13	0121	0737	0144	4	4	29	*				
14	0612	1719	1115	9	1	30	*				
15	0124	0755	0516	12	3	31	0108	0138	0120	4	2

* No Event
** Uncertain

COMMERCE - STANDARDS - BOULDER

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

JANUARY 1965

ARO-DRAO (OTTAWA) **2800; 2700 Mc/s**

JAN. 1965	URANE	DESCRIPTIVE TYPE	START UT	DURATION HRS. MIN.	MEAN FLUX	MAXIMUM TIME	MAXIMUM FLUX	REMARKS
26	3	Simple 3 A	1341	2 07	0.6	Indet.	1.2	
	1	Simple 1	1343	1	1	1343.3	2	
30	1	Simple 1	1924	9	1	1927	2	
31	2	Simple 2 f	2012	3	9	2012.9	18	
	4	Post Increase		45	1		2	

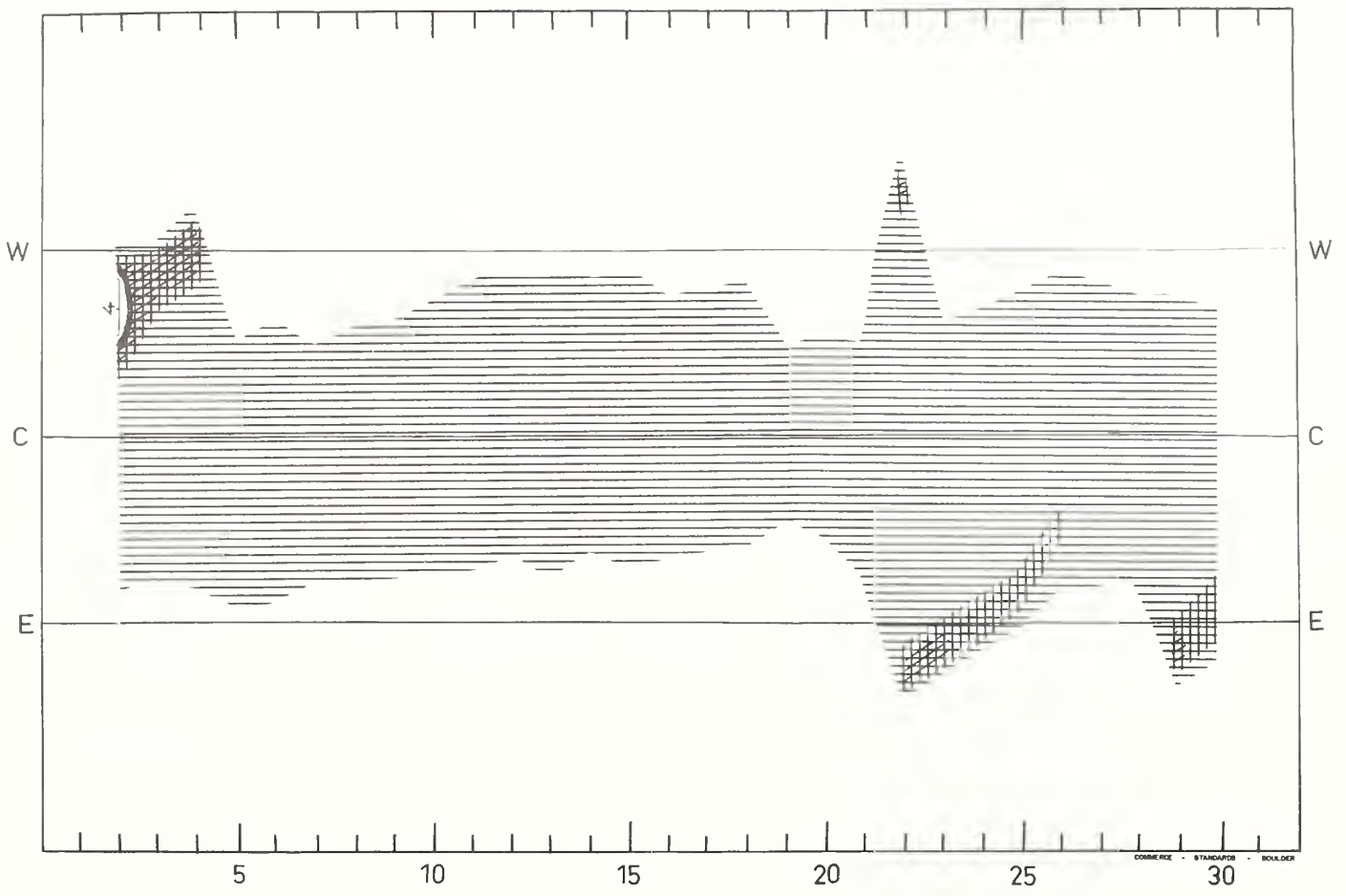
COMMERCE - STANDARDS - BOULDER

SOLAR RADIO EMISSION
INTERFEROMETRIC OBSERVATIONS

JANUARY 1965

NANÇAY

169 Mc/s



JANUARY 1965

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

JANUARY 1965

NBS BOULDER 108 Mc/s

Jan. 1965	TYPE	START UT	TIME OF MAXIMUM UT	DURATION MINUTES	INTENSITY
17	3	1617	1618	2.2	2

NOMINAL TIMES OF OBSERVATION

JANUARY 1965

NBS BOULDER 108 Mc/s

Jan. 1965	HOURS OF OBSERVATION U.T.	HOURS OF INTERFERENCE U.T.
1	1427-2330	1650-1915
2	1427-2331	2316-2331
3	1427-2332	1855-1920; 2210-2332
4	1427-2333	2308-2333
5	1427-2334	2300-2334
6	1427-2335	2302-2335
7	1427-2336	2305-2336
8	1427-2337	2300-2337
9	1427-2338	2259-2338
10	1427-2339	
11	1427-2340	
12	1426-2341	
13	1426-2342	
14	1426-2343	2300-2343
15	1425-2344	2259-2344
16	1425-2345	1700-1710; 2301-2345
17	1424-2346	2215-2346
18	1424-2347	1511-1720; 2325-2347
19	1423-2349	1512-1649; 2257-2349
20	1423-2350	1645-1755; 2300-2350
21	1422-2351	1500-1730
22	1422-2352	2300-2352
23	1421-2353	2230-2353
24	1420-2354	2217-2354
25	1420-2356	1613-1730; 2259-2356
26	1419-2357	1500-1532; 2259-2357
27	1418-2358	1800-1850; 2300-2358
28	1417-2359	2300-2359
29	1417-2400	2307-2400
30	1416-0002	2301-0002
31	1415-0003	1736-1751; 1856-2005; 2225-0003

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

OCTOBER 1964

Fort Davis

50-320 Mc/s

1964	OBSERVING HOURS	IMPORTANT BURSTS			FREQUENCY RANGE MC	REMARKS
		TYPE	TIMES U.T	INT		
Oct. 1	1330 - 2330					
Oct. 2	1330 - 2330					
Oct. 3	1330 - 2330					
Oct. 4	1330 - 2330					
Oct. 5	1330 - 2330					
Oct. 6	1330 - 2330					2140 - 2330: Weak I
Oct. 7	1558 - 2330					
Oct. 8	1331 - 2330					
Oct. 9	1331 - 2330					
Oct. 10	1331 - 2330					
Oct. 11	1330 - 2030					
Oct. 12	1330 - 2330					
Oct. 13	1330 - 2330					
Oct. 14	1330 - 2330					
Oct. 15	1330 - 2330					
Oct. 16	1330 - 2330					
Oct. 17	1330 - 2330					
Oct. 18	1330 - 2330					
Oct. 19	1330 - 2330					
Oct. 20	1330 - 2330					
Oct. 21	1330 - 2330					
Oct. 22	1330 - 2330					
Oct. 23	1331 - 2330					
Oct. 24	1330 - 2330					
Oct. 25	1330 - 2330					
Oct. 26	1330 - 2330					
Oct. 27	1330 - 2330					
Oct. 28	1330 - 2330					
Oct. 29	1330 - 2330					
Oct. 30	1330 - 2330					
Oct. 31	1330 - 2330					

COMMERCE - STANDARDS - BOULDER

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

NOVEMBER 1964

Fort Davis

50-320 Mc/s

1964	OBSERVING HOURS	IMPORTANT BURSTS			FREQUENCY RANGE MC	REMARKS
		TYPE	TIMES U.T	INT		
Nov. 1	1402 - 2345					
Nov. 2	1403 - 2345					
Nov. 3	1403 - 2345					
Nov. 4	1403 - 2345					
Nov. 5	1403 - 2345					
Nov. 6	1403 - 2345					
Nov. 7	1403 - 2345					
Nov. 8	1403 - 2345					
Nov. 9	1402 - 2345					
Nov. 10	1402 - 2345					
Nov. 11	1402 - 2345					
Nov. 12	1402 - 2345					
Nov. 13	1403 - 2345					
Nov. 14	1402 - 2345					
Nov. 15	1402 - 2345					
Nov. 16	1402 - 2345					
Nov. 17	1402 - 2345					
Nov. 18	1403 - 2345					
Nov. 19	1402 - 2345					
Nov. 20	1403 - 2345					
Nov. 21	1403 - 2345					
Nov. 22	1402 - 2345					
Nov. 23	1403 - 2345					
Nov. 24	1402 - 2345					
Nov. 25	1402 - 2345					
Nov. 26	1403 - 2345					
Nov. 27	1402 - 2345	IIIG	2247 - 2249	2	200 - <50	
Nov. 28	1402 - 2345					
Nov. 29	1402 - 2345					
Nov. 30	1402 - 2345					

COMMERCE - STANDARDS - BOULDER

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

DECEMBER 1964

Fort Davis **50-320 Mc/s**

1964	OBSERVING HOURS	IMPORTANT BURSTS			FREQUENCY RANGE MC	REMARKS
		TYPE	TIMES U.T	INT		
Dec. 1	1403 - 2345					
Dec. 2	1402 - 2345					
Dec. 3	1402 - 2345					
Dec. 4	1402 - 2345					
Dec. 5	1402 - 2345					
Dec. 6	1402 - 2345					
Dec. 7	1403 - 2001 2005 - 2345					
Dec. 8	1403 - 1741 2120 - 2345					
Dec. 9	1545 - 2345					
Dec. 10	1408 - 2345					
Dec. 11	1411 - 2345					
Dec. 12	1410 - 2345					
Dec. 13	1410 - 2345					
Dec. 14	1411 - 2345					
Dec. 15	1410 - 2345					
Dec. 16	1410 - 2345					
Dec. 17	1409 - 2345					
Dec. 18	1410 - 2345					
Dec. 19	1409 - 2345					
Dec. 20	1409 - 2345					
Dec. 21	1412 - 2345					
Dec. 22	1411 - 2345					
Dec. 23	1410 - 2345					
Dec. 24	1410 - 2345					
Dec. 25	1409 - 2345					
Dec. 26	1410 - 2345	I	2144 - 2345	1	170 - 100	
Dec. 27	1409 - 2345	I	1409 - 1840	1-2	250 - 75	
Dec. 28	1410 - 2345					
Dec. 29	1409 - 2345					
Dec. 30	1409 - 2345					
Dec. 31	1411 - 2345					

COMMERCE - STANDARDS - BOULDER

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

JANUARY 1965

High Altitude Observatory
Boulder

7.6-41 Mc/s

Date Jan 1965	Bursts			Frequency Range (Mc/s)	Date Jan 1965	Bursts			Frequency Range (Mc/s)
	Type	Time (U.T.)	Intensity			Type	Time (U.T.)	Intensity	
1 Jan	no observ.	1400-2330			24	III	1618:45-1619	1-	30-41
3	III	1829:45-1830	1-	34-41		III	1623-1623:15	1-	22-35
	III	2000:15-2001	2	26-41		III	1830:45-1831:15	1	21-41
	III	2001:15-2001:30	1-	33-41		III	1936:30-1937:30	2	12-41
	III	2002-2002:15	1-	30-41		III	2102:45-2103	1-	22-35
	III	2002:15-2002:30	1-	30-41		III	2130:30-2131	1	22-41
	III	2101:45-2102	1-	30-41		III	2133:45-2134	1-	26-36
	III	2246:30-2247	1+	29-41	25	III	1819-1819:30	1-	23-41
4	III	1830:15-1830:30	1-	29-41	26	III	2223:30-2224	1	22-41
5	III	2031-2031:15	1-	25-35	27	no observ.	1500-1600, 2200-2330		
	no observ.	2230-2330							
8	III	2145:30-2146	1-	21-41	28	no observ.	1400-1535		
11	no observ.	1510-1541			29	no observ.	1400-1600, 2200-2330		
14	no observ.	1400-1534, 2200-2330			30	no observ.	1400-1700		
					31	no observ.	1400-1730		

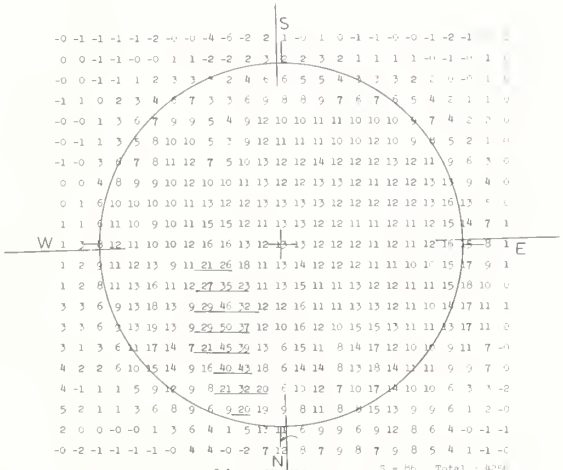
[redacted]

SOLAR RADIO EMISSION SPECTROHELIOGRAMS

JANUARY 1965

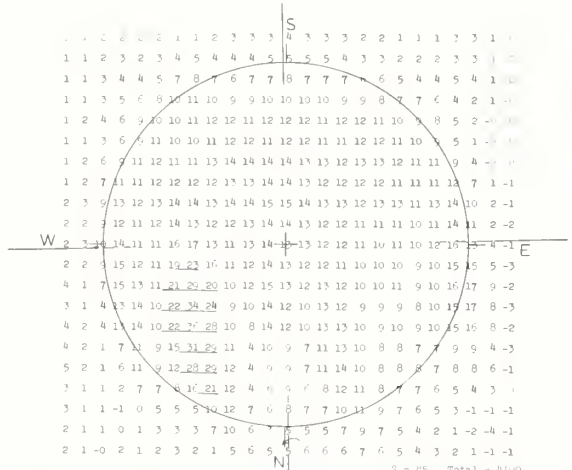
STANFORD

9.1 cm



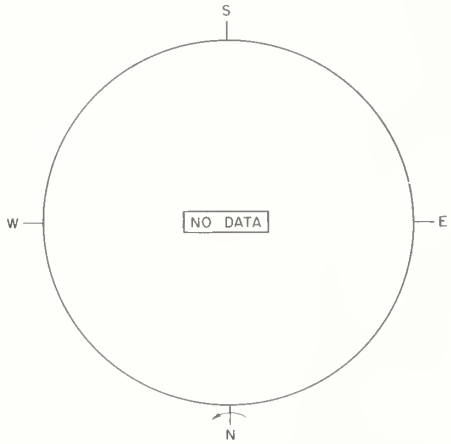
9.1 cm SPECTROHELIOGRAM S = [illegible] Total = 4295

Stanford, 1965 Jan 01, 20-21 hrs UT; Brightness Unit = [illegible] x 10^3 °K.

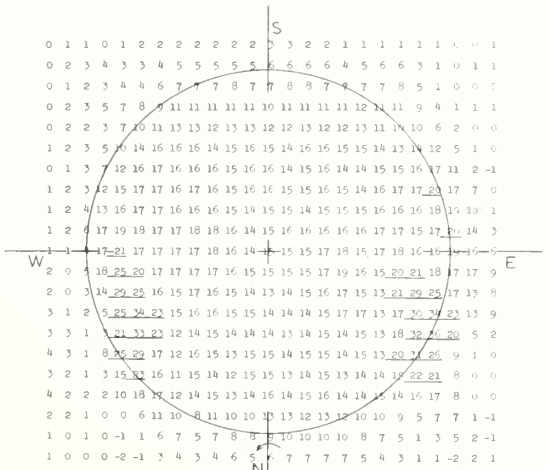


9.1 cm SPECTROHELIOGRAM S = 85 Total = 4199

Stanford, 1965 Jan 02, 20-21 hrs UT; Brightness Unit = [illegible] x 10^3 °K.

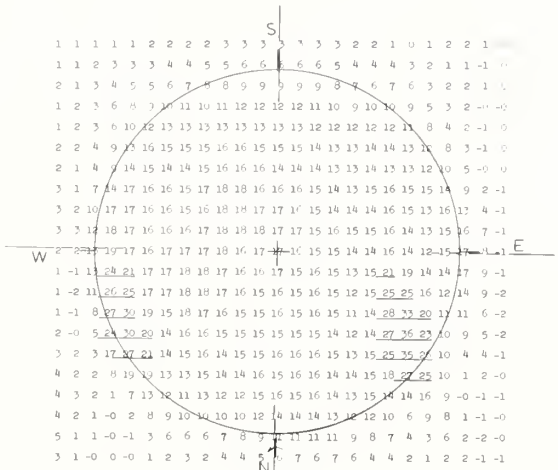


1965 JANUARY 03



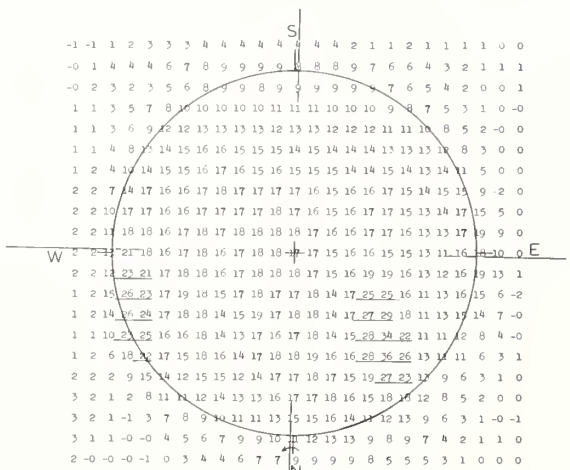
9.1 cm SPECTROHELIOGRAM S = 81 Total = 5450

Stanford, 1965 Jan 04, 20-21 hrs UT; Brightness Unit = 1.7 x 10^3 °K.



9.1 cm SPECTROHELIOGRAM S = 80 Total = 5327

Stanford, 1965 Jan 05, 20-21 hrs UT; Brightness Unit = 1.7 x 10^3 °K.

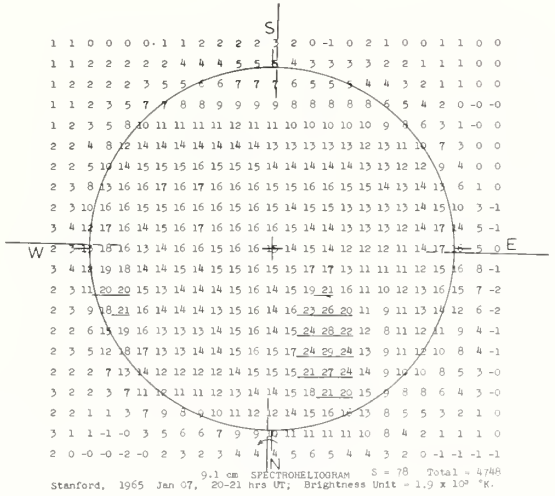


9.1 cm SPECTROHELIOGRAM S = 80 Total = 5499

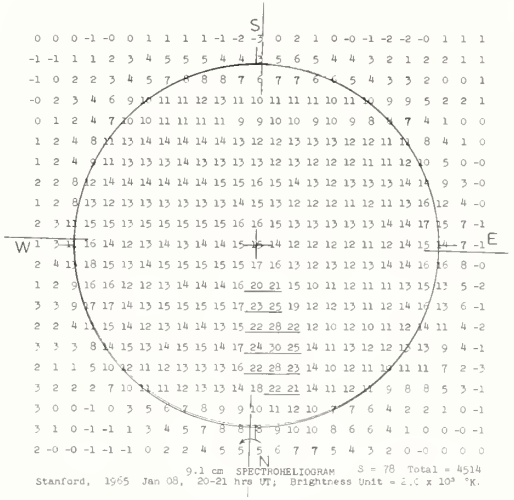
Stanford, 1965 Jan 06, 20-21 hrs UT; Brightness Unit = 1.7 x 10^3 °K.

SOLAR RADIO EMISSION SPECTROHELIOGRAMS

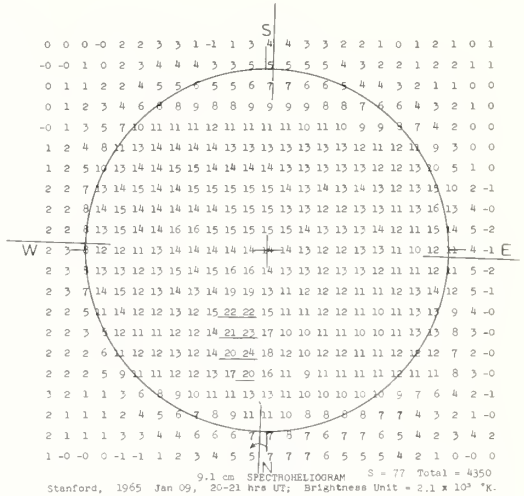
STANFORD — **JANUARY 1965** — **9.1 cm**



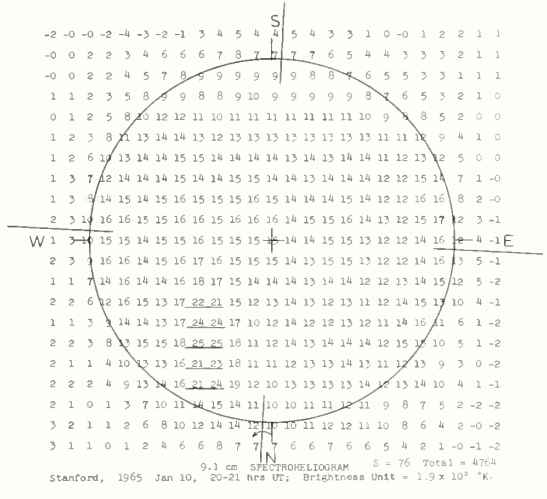
9.1 cm SPECTROHELIOGRAM S = 78 Total = 4788
Stanford, 1965 Jan 07, 20-21 hrs UT; Brightness Unit = 1.9 x 10^3 °K.



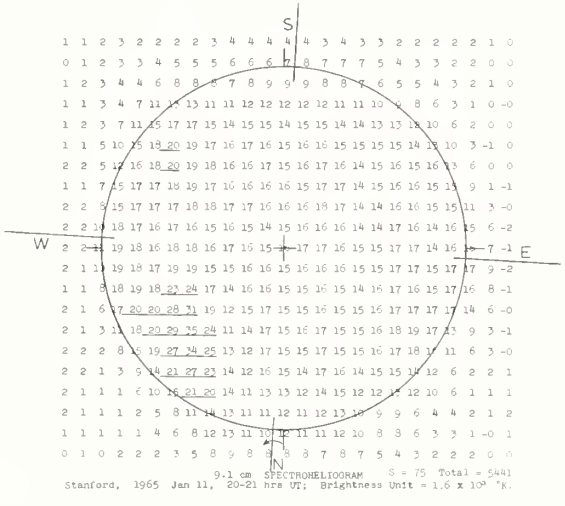
9.1 cm SPECTROHELIOGRAM S = 78 Total = 4514
Stanford, 1965 Jan 08, 20-21 hrs UT; Brightness Unit = 2.0 x 10^3 °K.



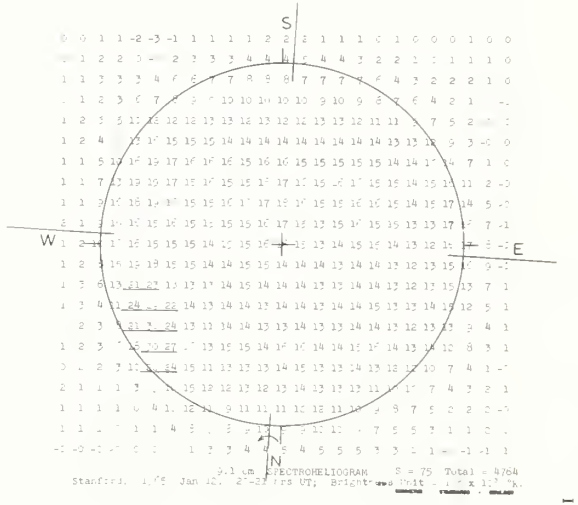
9.1 cm SPECTROHELIOGRAM S = 77 Total = 4350
Stanford, 1965 Jan 09, 20-21 hrs UT; Brightness Unit = 2.1 x 10^3 °K.



9.1 cm SPECTROHELIOGRAM S = 76 Total = 4764
Stanford, 1965 Jan 10, 20-21 hrs UT; Brightness Unit = 1.9 x 10^3 °K.



9.1 cm SPECTROHELIOGRAM S = 75 Total = 5441
Stanford, 1965 Jan 11, 20-21 hrs UT; Brightness Unit = 1.6 x 10^3 °K.



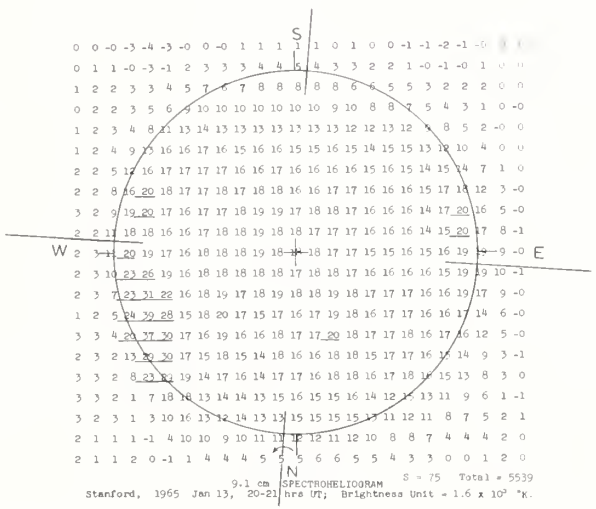
9.1 cm SPECTROHELIOGRAM S = 75 Total = 4764
Stanford, 1965 Jan 12, 20-21 hrs UT; Brightness Unit = 1.7 x 10^3 °K.

SOLAR RADIO EMISSION SPECTROHELIOGRAMS

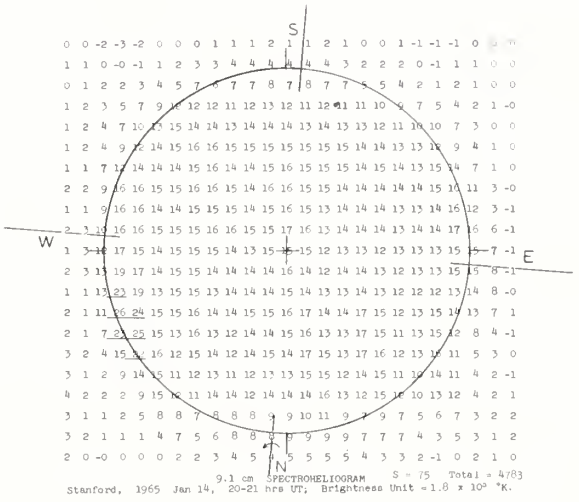
JANUARY 1965

STANFORD

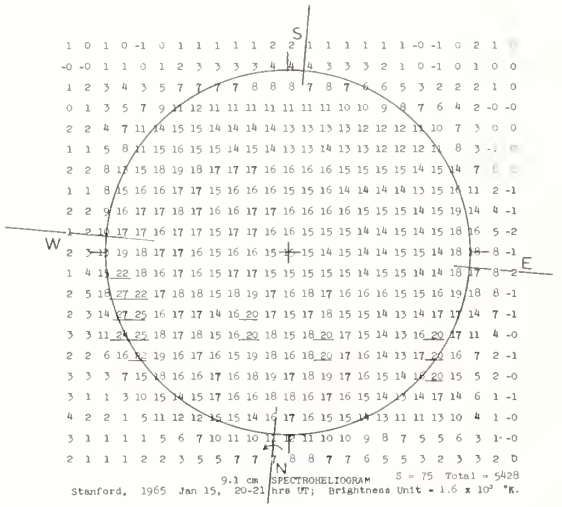
9.1 cm



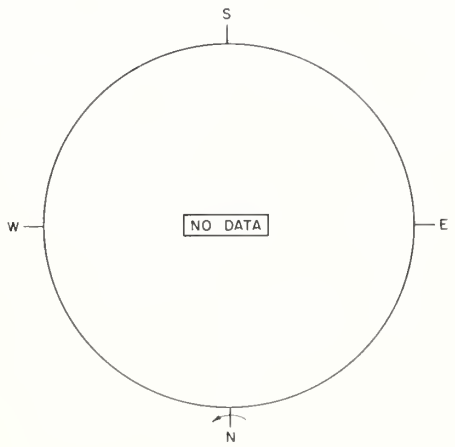
9.1 cm SPECTROHELIOGRAM S = 75 Total = 5539
Stanford, 1965 Jan 13, 20-21 hrs UT; Brightness Unit = 1.6 x 10^3 °K.



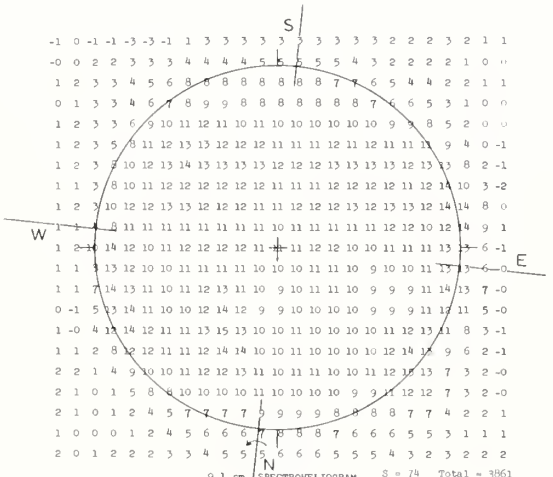
9.1 cm SPECTROHELIOGRAM S = 75 Total = 4783
Stanford, 1965 Jan 14, 20-21 hrs UT; Brightness Unit = 1.8 x 10^3 °K.



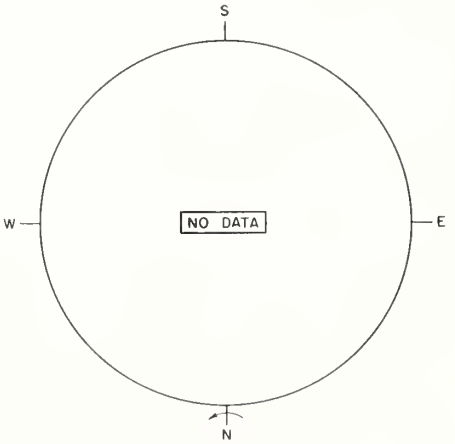
9.1 cm SPECTROHELIOGRAM S = 75 Total = 5428
Stanford, 1965 Jan 15, 20-21 hrs UT; Brightness Unit = 1.6 x 10^3 °K.



1965 JANUARY 16



9.1 cm SPECTROHELIOGRAM S = 74 Total = 3861
Stanford, 1965 Jan 17, 20-21 hrs UT; Brightness Unit = 2.2 x 10^3 °K.

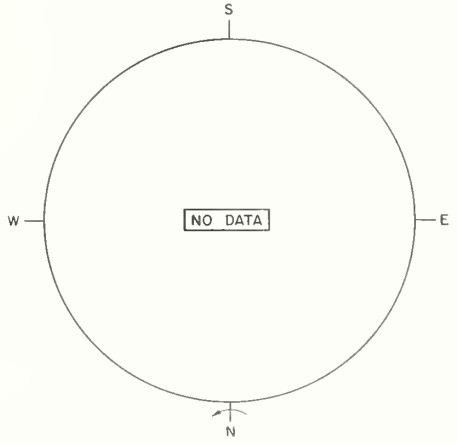


1965 JANUARY 18

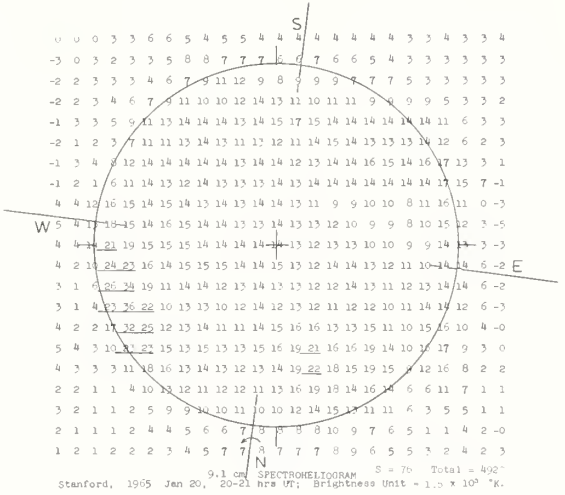
SOLAR RADIO EMISSION SPECTROHELIOGRAMS

JANUARY 1965

STANFORD **9.1 cm**

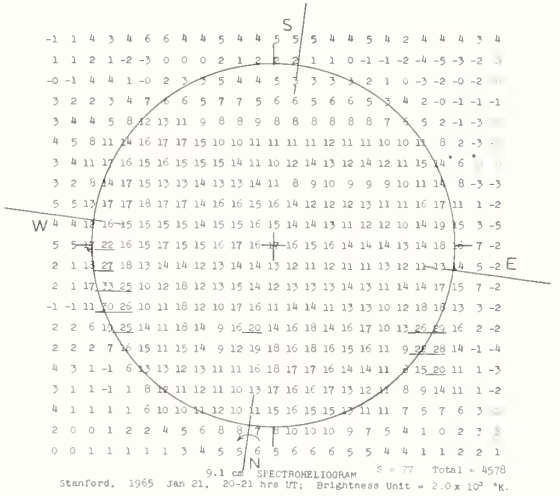


1965 JANUARY 19



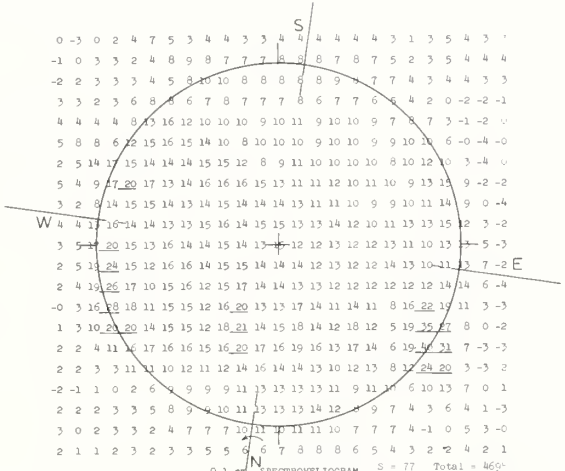
9.1 cm SPECTROHELIOGRAM S = 76 Total = 4927

Stanford, 1965 Jan 20, 20-21 hrs UT; Brightness Unit = 1.9 x 10^3 °K.



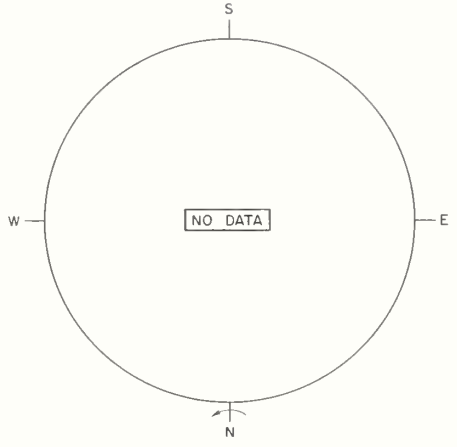
9.1 cm SPECTROHELIOGRAM S = 77 Total = 4578

Stanford, 1965 Jan 21, 20-21 hrs UT; Brightness Unit = 2.0 x 10^3 °K.

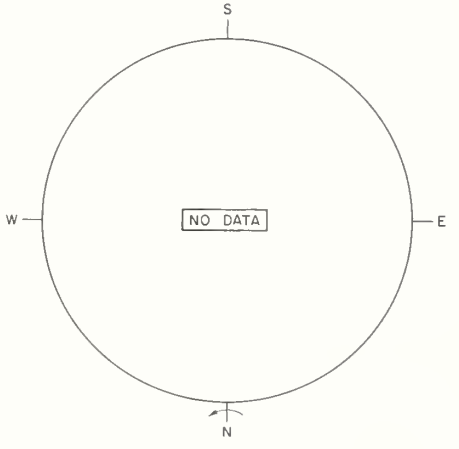


9.1 cm SPECTROHELIOGRAM S = 77 Total = 4694

Stanford, 1965 Jan 22, 20-21 hrs UT; Brightness Unit = 1.9 x 10^3 °K.



1965 JANUARY 23

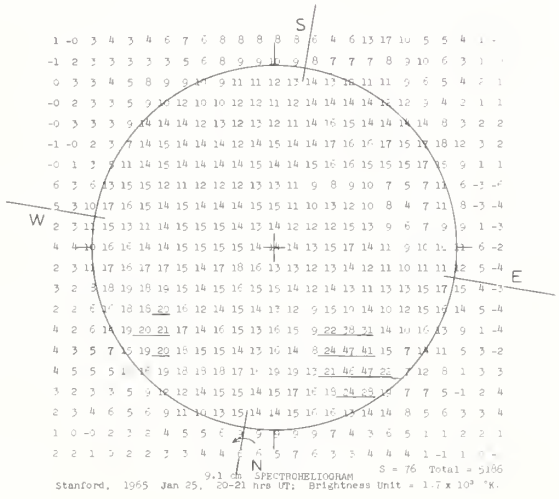


1965 JANUARY 24

SOLAR RADIO EMISSION SPECTROHELIOGRAMS

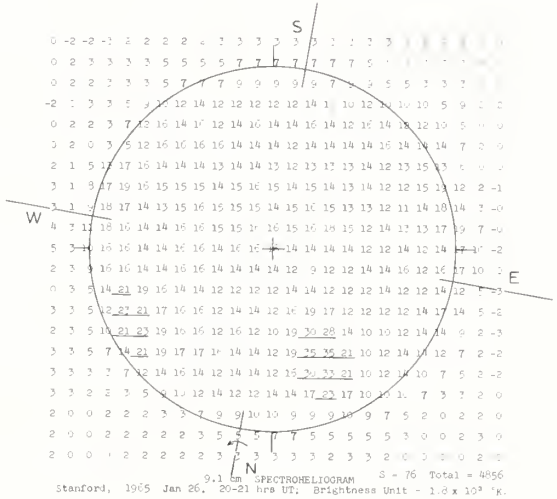
JANUARY 1965

STANFORD **9.1 cm**



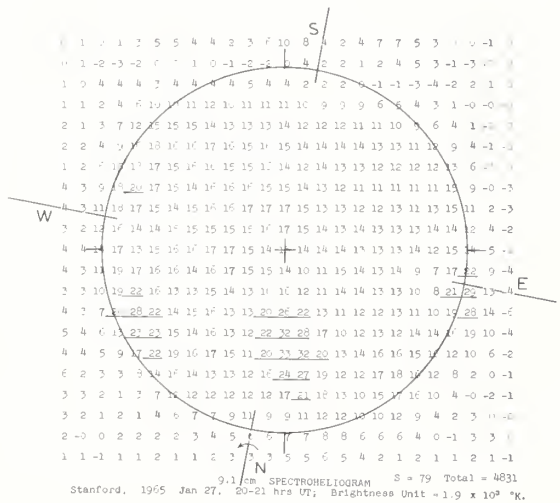
9.1 cm SPECTROHELIOGRAM S = 76 Total = 5186

Stanford, 1965 Jan 25, 20-21 hrs UT; Brightness Unit = 1.7 x 10^3 °K.



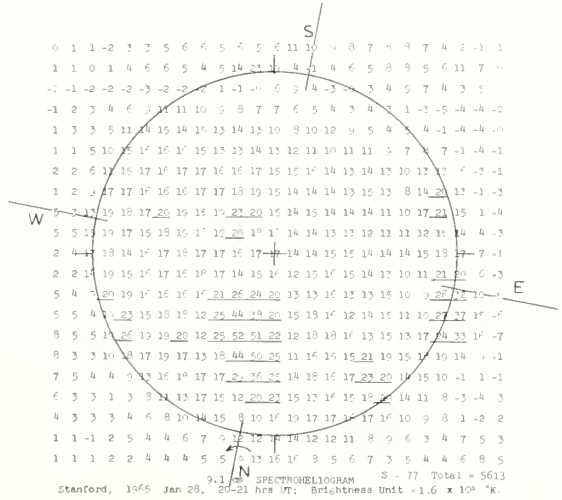
9.1 cm SPECTROHELIOGRAM S = 76 Total = 4856

Stanford, 1965 Jan 26, 20-21 hrs UT, Brightness Unit = 1.8 x 10^3 °K.



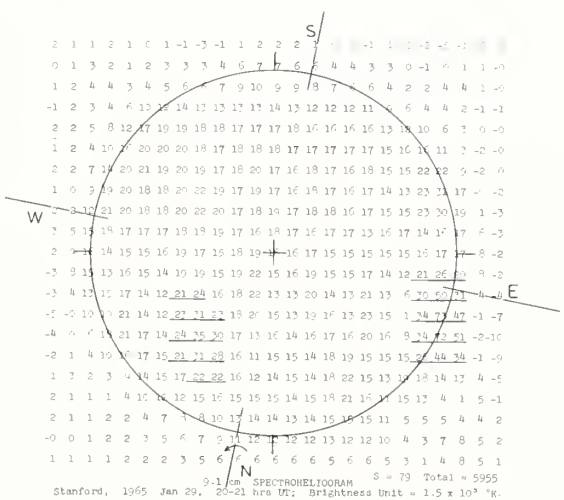
9.1 cm SPECTROHELIOGRAM S = 79 Total = 4831

Stanford, 1965 Jan 27, 20-21 hrs UT; Brightness Unit = 1.9 x 10^3 °K.



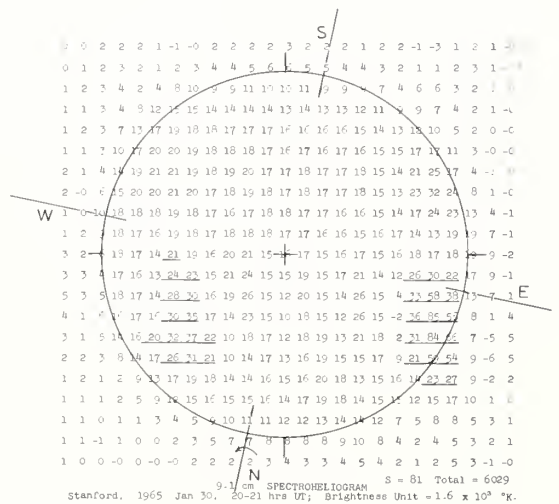
9.1 cm SPECTROHELIOGRAM S = 77 Total = 5613

Stanford, 1965 Jan 28, 20-21 hrs UT; Brightness Unit = 1.6 x 10^3 °K.



9.1 cm SPECTROHELIOGRAM S = 79 Total = 5955

Stanford, 1965 Jan 29, 20-21 hrs UT; Brightness Unit = 1.5 x 10^3 °K.



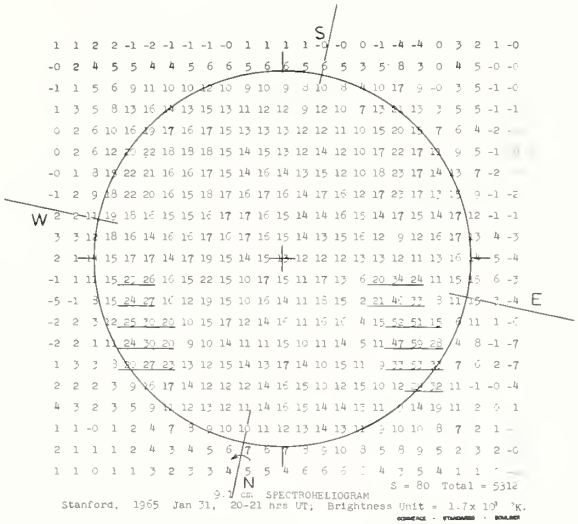
9.1 cm SPECTROHELIOGRAM S = 81 Total = 6029

Stanford, 1965 Jan 30, 20-21 hrs UT; Brightness Unit = 1.6 x 10^3 °K.

SOLAR RADIO EMISSION SPECTROHELIOGRAMS

JANUARY 1965

STANFORD **9.1 cm**



9.1 cm. SPECTROHELIOGRAM
S = 80 Total = 5312
Stanford, 1965 Jan 31, 20-21 hrs UT; Brightness Unit = 1.7x 10⁴ °K.

IVm

COSMIC RAY INDICES

(Neutron Monitors)

DECEMBER 1964

DEC. 1964	CHURCHILL	CLIMAX	DALLAS
	DAILY AVERAGE COUNTS PER HOUR	DAILY AVERAGE COUNTS PER HOUR	DAILY AVERAGE COUNTS PER HOUR
1	6528.7	3333.6	6579.6
2	6525.2	3348.1	6546.8
3	6520.9	3349.0	6561.4
4	6535.9	3356.5	6591.0
5	6537.5	3351.2	6609.8
6	6544.5	3358.1	6614.4
7	6546.5	3360.9	6619.0(23)
8	6551.5	3361.4	6627.0
9	6582.0	3372.8	6613.7
10	6581.7	3375.4	6584.2
11	6578.7	3375.0	6612.3
12	6595.5	3380.5	6619.4
13	6590.8	3378.1	6615.3
14	6570.5	3374.9	6646.8
15	6579.2	3369.3	6632.9
16	6569.4	3375.5	6607.5
17	6572.3	3365.5	6612.3
18	6593.9	3363.0	6620.3
19	6578.2(16)	3375.7	6617.8
20	6580.0(18)	3358.2	6614.8
21	6582.5	3352.9	6610.9
22	6612.9	3353.1	6632.8
23	6604.5	3355.3	6634.6
24	6622.6	3365.6	6645.6
25	6631.0	3375.6	6666.8
26	6622.4(22)	3374.0	6674.3
27	6578.0	3374.4	6650.9
28	6571.2(22)	3370.3(38)	6642.5(23)
29	6568.7(22)	3376.0	6603.3
30	6576.3(23)	3371.8	6600.0
31	6575.2(23)	3379.6	6606.3(22)

COMMERCE - STANDARDS - BOULDER

( ) Number of hours for which data are available if less than 24 (or number of section hours if less than 40 for Climax).

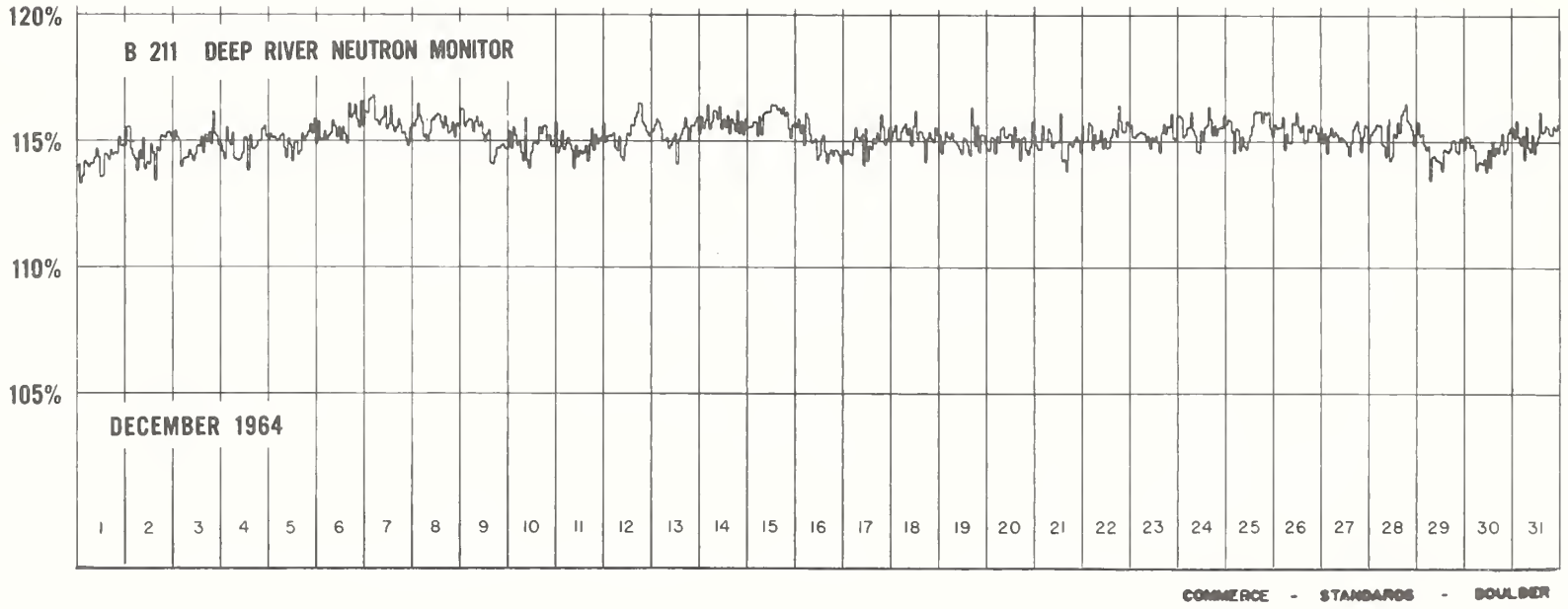
Churchill Super Neutron Monitor, Scaling Factor 120.

Climax IGC Station B305, Scaling Factor 128.

Dallas Super Neutron Monitor, Scaling Factor 120.

COSMIC RAY INDICES

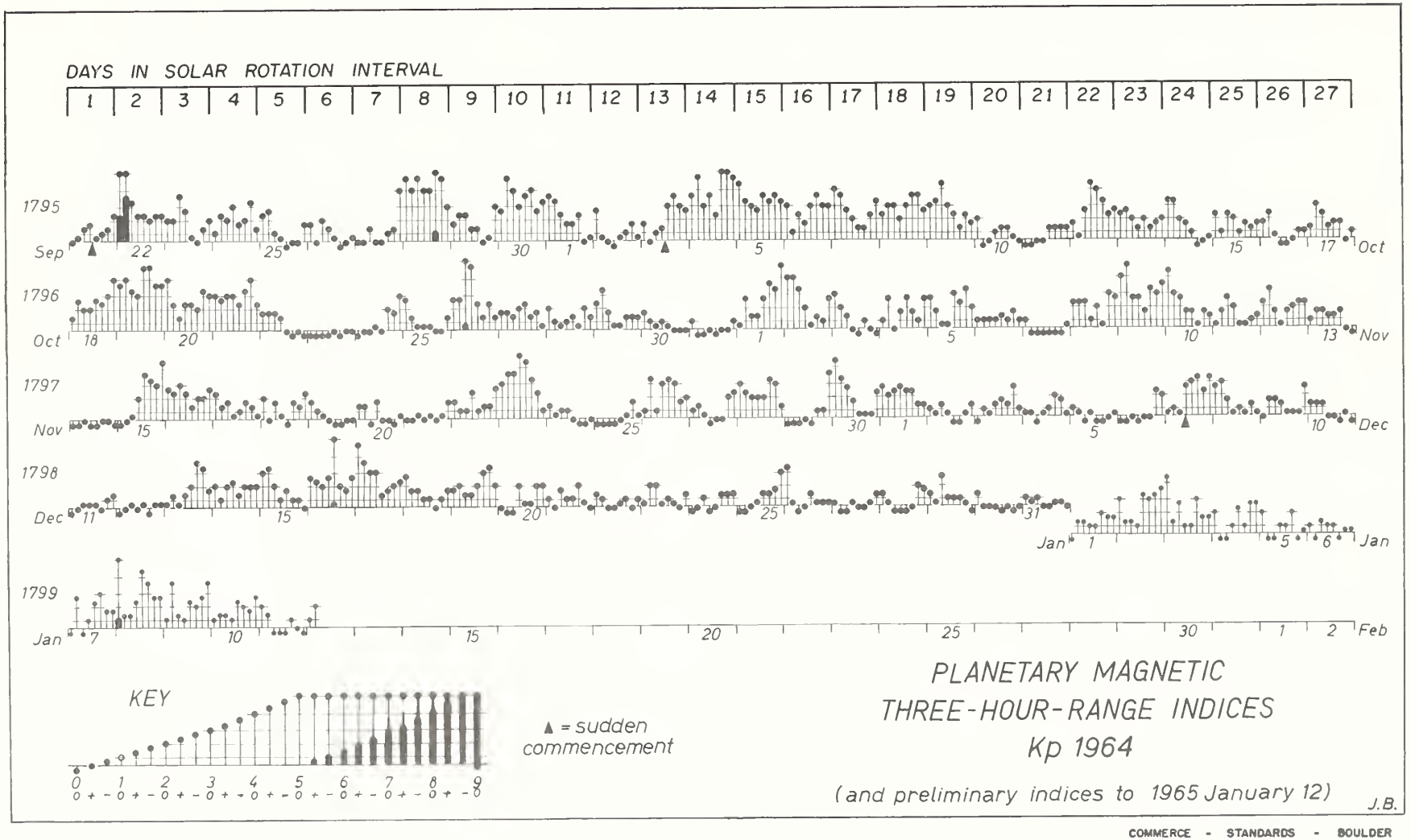
(Pressure Corrected Hourly Totals)



GEOMAGNETIC ACTIVITY INDICES

DECEMBER 1964

Dec. 1964	C	Values Kp Three hour Gr. interval 1 2 3 4	5 6 7 8	Sum	Ap	Final Selected Days
1	0.5	3- 2o 2+ 3-	2+ 2+ 1+ 1+	17o	8	Five
2	0.0	1o 1- 1+ 1-	0o 0o 1- 1+	6-	3	Quiet
3	0.3	0o 1o 1- 1+	2- 1+ 3- 1o	10-	5	
4	0.2	1- 1- 0o 1-	1o 2o 2- 1-	7+	4	5
5	0.0	1o 1- 0o 1-	0o 0o 0+ 1-	3+	2	12
						27
6	0.3	0o 0o 0+ 0o	0+ 0+ 2+ 2o	5+	3	30
7	0.7	1- 1o 1- 3-	3o 3+ 2+ 3+	17o	10	31
8	0.2	3- 3o 2- 1-	1o 1- 1+ 1-	12-	6	
9	0.3	0+ 2- 2- 1+	1- 1- 1- 3-	10-	5	
10	0.0	1+ 1+ 1+ 0+	0+ 0o 1- 0o	5+	3	
11	0.1	0o 0+ 1- 1-	1- 0+ 1o 1+	5o	3	Five
12	0.1	0o 0+ 1- 0+	1- 0o 1- 1-	3+	2	Disturbed
13	0.7	1- 1+ 1- 1+	2o 4- 3+ 2-	15-	9	
14	0.6	2o 1o 2o 2+	1+ 2o 2o 2o	15-	7	7
15	0.3	3o 3+ 2o 1o	2- 1o 1o 0+	13+	8	13
						16
16	1.1	3- 2+ 2o 3-	5+ 2o 2- 3-	21+	15	17
17	0.8	5- 4- 3o 3o	1+ 2- 2o 2+	22-	15	19
18	0.2	3- 2- 2- 1o	1o 0+ 1o 2-	11o	6	
19	0.7	2- 2o 1+ 1+	2o 3o 3+ 2o	17-	9	
20	0.3	0+ 0o 0o 2o	1- 1- 2o 2o	8-	4	
21	0.2	1o 0+ 2- 1o	1o 2o 1- 0+	8o	4	Ten
22	0.1	1+ 1o 0+ 0+	1- 1o 0+ 1o	6o	3	Quiet
23	0.2	1- 2o 2o 1-	1o 1- 0+ 1+	9-	4	
24	0.1	0o 0+ 1o 0o	0+ 1+ 1+ 1+	6-	3	2
25	0.4	0o 0o 0+ 1-	1+ 1+ 2- 3o	8+	4	5
						10
26	0.1	3+ 1- 0o 0+	1+ 1- 1- 1-	8-	5	11
27	0.0	1- 0o 0o 1-	0+ 0+ 1- 1+	4o	2	12
28	0.3	1+ 1- 0o 0o	0o 0+ 2o 2-	6o	3	22
29	0.1	1+ 1- 3- 1o	1o 1o 0+ 0o	8o	4	24
30	0.0	1+ 0+ 0+ 0+	0o 0+ 0o 0+	3o	2	27
31	0.0	1o 1- 1o 0+	0+ 1- 1- 0+	5o	3	30
						31
Mean:	0.29			Mean:	5	



COMMERCE - STANDARDS - BOULDER

CRPL RADIO PROPAGATION QUALITY FIGURES AND FORECASTS

NORTH ATLANTIC, NORTH PACIFIC — DECEMBER 1964

DEC. 1964	WHOLE DAY INDICES			ADVANCE FORECASTS (Jc-REPORTS) FOR WHOLE DAY	NORTH ATLANTIC								NORTH PACIFIC			GEOMAGNETIC INDICES						
					6-HOURLY QUALITY FIGURES				SHORT-TERM FORECASTS ISSUED ABOUT ONE HOUR IN ADVANCE OF.				8-HOURLY QUALITY FIGURES			A_{FR}		A_{FR}		K_{SI}		A_{SI}
	NORTH ATLANTIC	NORTH PACIFIC	AVERAGE HIGH LATITUDE		00 TO 06	06 TO 12	12 TO 18	18 TO 24	00	06	12	18	03 TO 11	11 TO 19	19 TO 03	HALF (1)	DAY (2)	OBSERVED	PREDICTED	HALF (1)	DAY (2)	
1	6o	5	6	6	6-	6-	7-	6+	5	5	7	6	5	5	6	3	1	8	7	2	1	7
2	6o	5	6	6	6-	6-	7-	6o	5	6	7	7	5	5	6	1	1	2	5	1	0	1
3	6o	5	6	6	6-	6o	6+	6-	6	6	7	6	5	5	6	1	1	3	5	1	1	3
4	6o	5	6	6	6-	6+	7-	6o	6	6	7	6	-	5	6	1	1	2	3	0	0	2
5	6+	5	6	6	6o	6+	7-	6+	6	6	7	6	5	5	6	0	1	1	5	0	0	1
6	6+	5	6	6	6o	6+	7-	6+	6	6	7	6	5	5	6	0	1	2	11	0	1	2
7	6+	5	6	6	6o	6o	7-	6+	6	6	7	6	5	5	6	1	2	6	7	1	2	7
8	6+	6	6	6	6o	6o	7-	7-	6	6	7	6	6	6	6	2	1	5	5	1	1	3
9	6+	5	6	6	6-	6-	7-	6+	6	6	7	6	5	5	6	1	1	3	5	1	0	4
10	6o	5	6	6	6o	5o	7-	6+	6	6	7	6	6	6	5	1	0	2	3	1	0	2
11	6+	5	6	6	6o	5+	7o	7-	6	6	7	6	-	5	5	1	1	2	3	1	0	2
12	6+	5	6	6	6-	6o	7-	6+	6	5	7	7	5	5	5	0	1	1	10	0	0	1
13	6o	5	6	6	6-	5+	6+	7-	6	6	7	6	-	5	6	1	3	7	6	0	2	3
14	6+	6	6	6	6+	6-	7-	7-	6	6	7	6	6	5	6	2	1	5	3	2	1	4
15	6o	5	6	6	6-	6-	7-	6+	6	6	7	7	5	4	6	2	1	6	3	2	1	5
16	6o	5	6	6	6-	6-	7-	6+	6	5	7	6	5	4	6	2	3	11	2	2	2	15
17	6-	5	5	6	5o	5-	7-	6+	6	5	7	6	5	5	7	3	1	11	9	(4)	1	13
18	6o	5	6	6	6-	6o	7-	6+	6	5	7	6	5	5	6	2	1	4	10	1	1	3
19	6+	5	6	6	6-	6o	7-	7-	6	5	7	6	5	6	7	1	2	4	10	1	2	5
20	6+	6	6	6	6o	6o	7-	6+	6	6	7	7	5	5	6	1	1	3	11	1	1	3
21	6+	5	6	6	6o	6-	7-	6+	6	6	7	6	5	5	6	1	1	2	6	1	1	3
22	6o	5	6	6	6-	6o	7-	6+	6	6	7	6	5	5	7	1	0	1	4	1	0	2
23	6o	5	6	6	6-	5+	7-	7-	6	6	7	7	5	6	6	2	0	4	4	2	0	5
24	6+	5	6	6	6o	6-	7-	7-	6	6	7	7	5	5	6	0	1	2	4	0	0	1
25	6o	5	6	6	6+	6-	7-	6+	6	5	7	7	5	5	6	0	2	3	5	0	2	3
26	6o	5	6	6	6o	6-	7-	6o	6	5	7	6	-	5	6	1	0	2	5	1	1	3
27	6+	5	6	6	6+	6-	7-	7-	6	5	7	6	5	5	6	0	0	0	8	0	0	0
28	6+	5	6	6	6o	6o	7-	6+	6	6	7	7	5	5	6	1	1	2	7	0	0	1
29	6o	5	6	6	6-	5+	7-	6+	6	6	7	7	5	5	6	1	0	3	4	1	1	3
30	6o	5	6	6	6o	6-	7-	6-	6	6	7	6	5	5	6	0	0	0	3	1	0	1
31	6+	6	6	6	6-	6o	7-	6+	6	5	7	6	6	5	6	1	1	2	3	0	0	2

SCORE							
QUIET PERIODS:	P	30	28	17	29	18	
	S	1	3	14	2	13	
	U	0	0	0	0	0	
	F	0	0	0	0	0	
DISTURBED PERIODS:	P	0	0	0	0	0	
	S	0	0	0	0	0	
	U	0	0	0	0	0	
	F	0	0	0	0	0	

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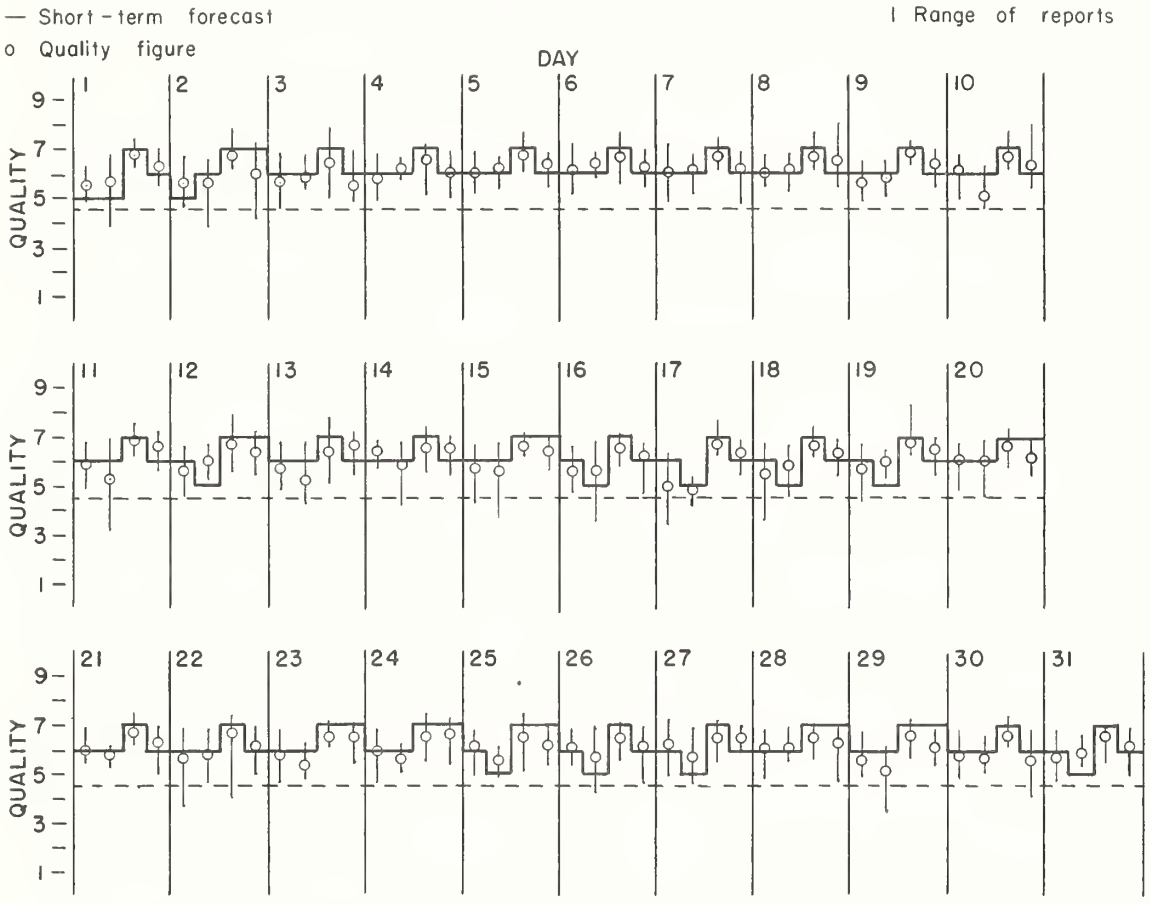
NOTES:

1. The advance Jc forecasts are scored against the average high latitude whole day indices.
2. The observed indices for the North Pacific are low weight because of insufficient data available for their preparation.
3. The predicted A_{Fr} indices are issued each Wednesday for the coming seven days. The value for the first day of each prediction period is underscored.

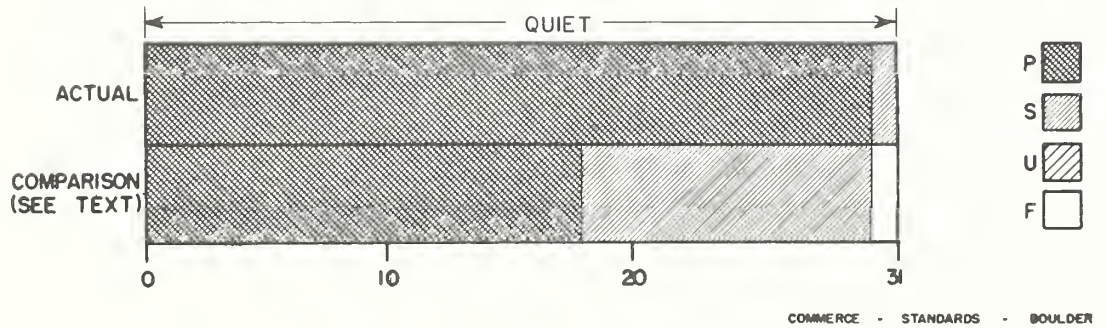
NORTH ATLANTIC

DECEMBER 1964



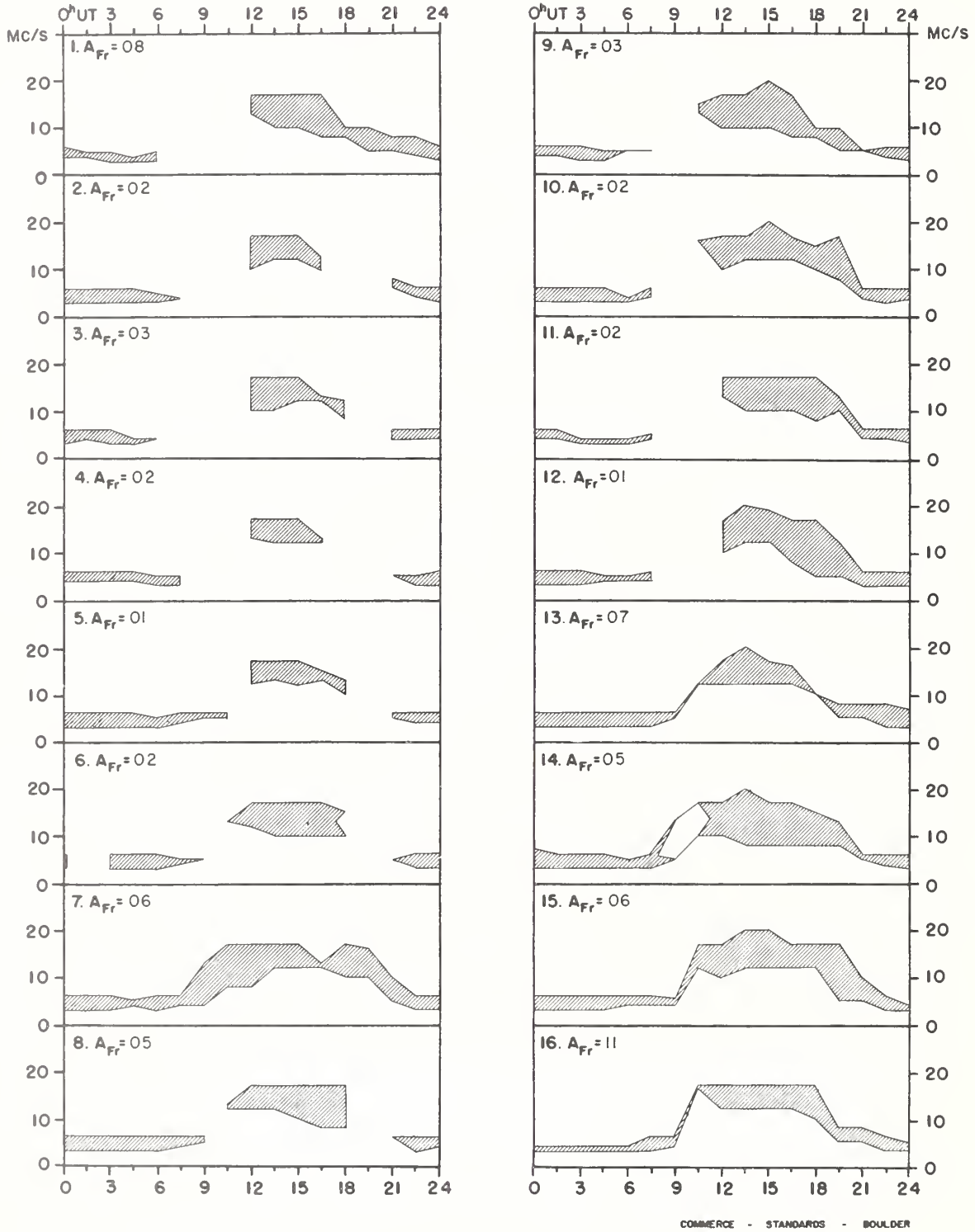
OUTCOME OF ADVANCE FORCASTS--FINAL ESTIMATES (1 TO 7 DAYS AHEAD)

HIGH LATITUDE

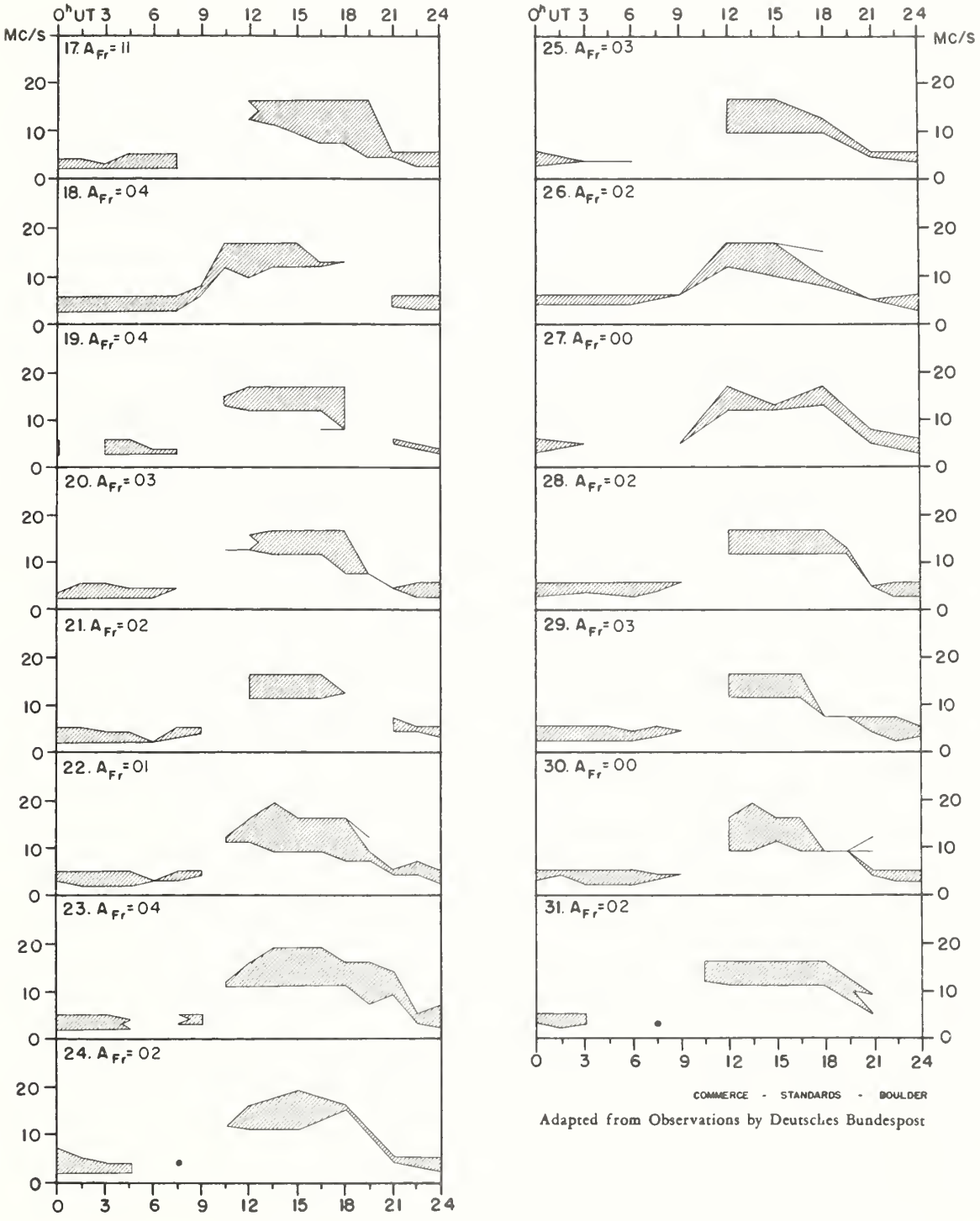


USEFUL FREQUENCY RANGES -- NORTH ATLANTIC PATH

DECEMBER 1964



DECEMBER 1964



Adapted from Observations by Deutsches Bundespost

IQSY ALERT PERIODS

INTERNATIONAL URSIGRAM AND WORLD DAYS SERVICE

JANUARY 1965

JAN. 1965	TIME OF ISSUE UT	ADVANCE GEOPHYSICAL ALERT	WORLDWIDE GEOPHYSICAL ALERT			
			NO.	TYPE	TIMING	ELABORATION
3	1600	McMath, Solar Flare 03/1433Z				
4	0400		154	Solar Activity	Exists	
5	0400		155	Solar Activity	Exists	
6	0400		156	Solar Activity Magnetic Calm	Exists Exists	
7	0400		157	Magnetic Calm	Exists	
23	0400		158	Solar Activity	Exists	East Limb
25	0400		159	Magnetic Calm	Exists	
26	0400		160	Magnetic Calm	Exists	
27	2005	McMath, Solar Activity				

COMMERCE - STANDARDS - BOULDER

RADAR METEOR INDEX

The values presented in Table IXa have been derived by Dr. Peter Millman, National Research Council, Ottawa, Canda, from the radar hourly rates published by Millman, P. M. and McIntosh, B. A. in Canadian Journal of Physics, 42, 1730-1742, 1964. Random statistical variations in the rates have been eliminated. This index refers to the mean for the 24 hours of the Universal Time date and applies to any year. In most cases they will apply fairly well to visual meteors, but at certain times of the year, particularly in June, when most of the activity is in the daytime, the visual rates seen at night will be much lower. Another important point to note is that these rates refer to a latitude of 45° north and may be quite different for the equator or south latitudes.

The index for ≤ 1 mag covers the range of rates from 0 to 25 per hour and index for ≤ 6 mag covers the range from 100 to 300 per hour.

RADAR METEOR INDEX

Date	Jan.		Feb.		Mar.		Apr.		May.		June		Jul.		Aug.		Sept.		Oct.		Nov.		Dec.	
	App Vis Mag		App Vis Mag		App Vis Mag		App Vis Mag		App Vis.Mag		App Vis Mag		App Vis Mag		App Vis Mag		App Vis Mag		App Vis Mag		App Vis Mag		App Vis Mag	
	≤1	≤6	≤1	≤6	≤1	≤6	≤1	≤6	≤1	≤6	≤1	≤6	≤1	≤6	≤1	≤6	≤1	≤6	≤1	≤6	≤1	≤6	≤1	≤6
1	2	3	1	1	1	1	1	2	2	4	3	5	3	4	3	5	2	3	2	6	2	5	2	5
2	2	4	1	1	1	1	1	2	2	4	4	5	3	4	3	5	2	4	2	6	2	5	2	5
3	7	8	1	1	1	1	1	2	2	4	4	6	3	5	3	5	2	4	2	6	2	5	2	5
4	3	3	1	1	1	1	1	2	3	5	5	6	2	6	3	5	2	4	2	6	2	5	2	5
5	2	3	1	1	1	1	1	2	3	5	5	6	2	6	3	5	2	5	2	6	2	5	2	5
6	2	3	1	1	1	1	1	2	3	6	5	7	2	5	4	5	2	5	2	5	2	5	2	5
7	2	2	1	1	1	1	1	1	2	5	6	7	2	5	4	5	2	5	2	5	2	5	2	5
8	1	2	1	1	1	1	1	1	2	5	6	8	2	4	4	5	2	5	2	5	2	5	2	5
9	1	2	1	1	1	1	1	1	2	5	6	8	2	4	4	5	2	5	2	5	2	4	2	6
10	1	2	1	1	1	1	1	1	2	5	6	8	2	4	5	6	2	5	2	6	2	4	3	6
11	1	3	1	1	1	1	1	2	2	5	5	8	2	4	6	6	2	5	2	6	2	4	3	7
12	1	3	1	1	1	1	1	2	2	5	5	8	2	4	10	6	2	5	2	6	2	4	5	9
13	1	3	1	1	1	1	1	2	2	5	5	8	2	4	7	5	2	5	2	6	2	4	8	10
14	1	3	1	1	1	1	1	2	2	5	5	8	2	5	5	5	2	5	2	6	2	4	10	9
15	1	3	1	1	1	1	1	2	2	5	4	8	2	5	4	4	2	5	2	6	2	4	3	5
16	2	3	1	1	1	1	1	2	2	5	4	8	2	5	3	3	2	5	2	6	3	4	2	4
17	2	3	1	1	1	1	1	2	2	5	4	8	2	5	2	3	2	5	2	6	3	4	2	4
18	2	2	1	1	1	1	1	2	2	5	4	7	2	5	2	3	2	5	2	6	2	4	2	3
19	2	2	1	1	1	1	1	2	2	5	4	7	2	5	2	4	2	5	2	7	2	4	2	3
20	1	2	1	1	1	1	1	2	2	5	3	7	2	6	2	4	2	6	3	8	2	4	2	3
21	1	2	1	1	1	1	2	2	2	4	3	7	2	6	2	4	2	6	3	8	2	4	2	3
22	1	1	1	1	1	1	3	3	2	4	3	7	2	6	2	4	2	6	3	7	2	4	3	3
23	1	1	1	1	1	1	2	3	2	4	3	7	2	6	2	4	2	6	2	6	2	4	2	3
24	1	1	1	1	1	1	2	3	2	4	3	7	2	6	2	4	2	6	2	6	2	4	2	3
25	1	1	1	1	1	1	1	3	2	4	3	6	2	6	2	4	2	6	2	5	2	5	2	3
26	1	1	1	1	1	1	1	3	2	4	3	6	2	6	2	4	2	6	2	5	2	5	2	3
27	1	1	1	1	1	1	1	3	2	4	3	6	2	6	2	3	2	6	2	5	2	5	2	3
28	1	1	1	1	1	1	1	3	2	4	3	6	3	6	2	3	2	7	2	5	2	5	2	3
29	1	1			1	1	1	3	2	4	3	5	3	6	2	3	2	7	2	5	2	5	2	3
30	1	1			1	2	2	3	2	4	3	4	3	6	2	3	2	7	2	5	2	5	2	3
31	1	1			1	2			2	5			3	5	2	3			2	5			2	3

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